

User Guide

hp StorageWorks ESL E-Series Tape Library

First Edition (January 2004)

Part Number: 350799-001

This guide describes procedures for operating, relocating, and troubleshooting the HP StorageWorks ESL E-Series tape library.



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ESL E-Series Tape Library User Guide
First Edition (January 2004)
Part Number: 350799-001
Regulatory Model Number: LVLDC-0401

About This Guide

This user guide provides information to help you:

- Operate the tape library
- Relocate the tape library
- Troubleshoot the tape library

“About this Guide” topics include:

- [Related documentation](#), page 4
- [Conventions](#), page 4
- [Getting help](#), page 15

Related documentation

In addition to this guide, HP provides corresponding information:

- *HP StorageWorks ESL E-Series Unpacking and Installation Guide*
- *HP StorageWorks ESL E-Series Tape Library Service Manual*
- *HP StorageWorks ESL E-Series Tape Library Site Survey*

Conventions

Conventions consist of the following:

- [Document conventions](#)
- [Text symbols](#)
- [Equipment symbols](#)

Document conventions

This document follows the conventions in [Table 1](#).

Table 1: Document conventions

Convention	Element
Blue text: Figure 1	Cross-reference links
Bold	Menu items, buttons, and key, tab, and box names
<i>Italics</i>	Text emphasis and document titles in body text
Monospace font	User input, commands, code, file and directory names, and system responses (output and messages)
<i>Monospace, italic font</i>	Command-line and code variables
Blue underlined sans serif font text (http://www.hp.com)	Web site addresses

Text symbols

The following symbols may be found in the text of this guide. They have the following meanings:



WARNING: Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or death.



WAARSCHUWING: Als u de aanwijzingen na dit kopje niet opvolgt, kan dit leiden tot persoonlijk letsel of levensgevaar.



AVERTISSEMENT : le non-respect de ces instructions présente des risques potentiellement très graves pour l'utilisateur.



AVVERTENZA: Un messaggio così evidenziato indica che la mancata osservanza delle istruzioni fornite può provocare lesioni personali o mettere in pericolo la vita dell'utente.



VORSICHT: In dieser Form hervorgehobener Text weist darauf hin, dass die Nichtbeachtung der Anleitungen zu Verletzungen oder zum Tod führen kann.



ADVERTENCIA: El texto con esta marca indica que si no se siguen las instrucciones, pueden producirse lesiones físicas o incluso la muerte.



警告: その指示に従わないと、人体への傷害や生命の危険を引き起こす恐れがある警告事項を表します。



Caution: Text set off in this manner indicates that failure to follow directions could result in damage to equipment or data.

Tip: Text in a tip provides additional help to readers by providing nonessential or optional techniques, procedures, or shortcuts.

Note: Text set off in this manner presents commentary, sidelights, or interesting points of information.

Equipment symbols

The following equipment symbols may be found on hardware for which this guide pertains. They have the following meanings:



Any enclosed surface or area of the equipment marked with these symbols indicates the presence of electrical shock hazards. Enclosed area contains no operator serviceable parts.

WARNING: To reduce the risk of personal injury from electrical shock hazards, do not open this enclosure.



Deze symbolen duiden op het risico van elektrische schokken. De ingesloten gedeelten kunnen niet door de gebruiker worden onderhouden.

WAARSCHUWING: Open dit gedeelte niet om het risico van letsel door elektrische schokken te beperken.



Apposés sur une surface ou une zone du matériel, ces symboles signalent le risque d'électrocution. La zone ne contient aucun élément pouvant être remplacé ou réparé par l'utilisateur.

AVERTISSEMENT : pour réduire le risque d'électrocution, n'ouvrez pas ce boîtier.



L'applicazione di uno di questi simboli su una superficie o su un'area dell'apparecchiatura indica il pericolo di scosse elettriche. Le aree chiuse contrassegnate da questi simboli contengono parti che non possono essere sostituite dall'operatore.

AVVERTENZA: Non aprire le parti chiuse per evitare il rischio di lesioni personali causate da scosse elettriche.



Wenn Oberflächen oder Bereiche eines Geräts mit diesem Symbol gekennzeichnet sind, besteht dort die Gefahr eines elektrischen Schlags. Der betreffende Bereich enthält keine durch den Benutzer zu wartenden Teile.

VORSICHT: Um Verletzungen durch elektrischen Schlag zu vermeiden, darf dieser geschlossene Bereich nicht geöffnet werden.



Cualquier superficie o área cubierta del equipo donde aparezcan estos símbolos indica la presencia de descargas eléctricas. La zona cubierta contienen piezas no reparables por el operador.

ADVERTENCIA: Para reducir el riesgo de daños provocados por descargas eléctricas, no abra este componente.



これらの記号が貼付された装置の表面または内部部品に触れると、感電の危険があることを示します。修理はすべて、資格のある担当者に依頼してください。

警告： 感電防止のため、カバーは開けないでください。



Any RJ-45 receptacle marked with these symbols indicates a network interface connection.

WARNING: To reduce the risk of electrical shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.



Elke RJ-45-connector met deze symbolen geeft een netwerkaansluiting aan.

WAARSCHUWING: Om het risico van een elektrische schok, brand of schade aan apparaten te voorkomen mogen geen telefoon- of telecommunicatieconnectoren in deze aansluiting worden gestoken.



Apposés sur une prise RJ-45, ces symboles indiquent une connexion d'interface réseau.

AVERTISSEMENT : pour réduire le risque d'électrocution, d'incendie ou de dommages matériels, ne branchez pas de connecteurs de téléphone ou de télécommunication sur cette prise.



Le prese RJ-45 contrassegnate da questi simboli indicano un collegamento di rete.

AVVERTENZA: Per evitare il rischio di scosse elettriche, incendi o danni alle apparecchiature, non inserire in questa presa connettori telefonici o per telecomunicazioni.



Diese Symbole kennzeichnen eine RJ-45-Anschlussbuchse als Netzwerkverbindung.

VORSICHT: Verbinden Sie niemals ein Telefon oder andere Telekommunikationseinrichtungen mit einer solchen Anschlussbuchse. Es besteht die Gefahr eines elektrischen Schlags, eines Brandes oder der Beschädigung von Geräten.



Los receptáculos RJ-45 marcados con estos símbolos indican una conexión de interfaz de red.

ADVERTENCIA: Para reducir el riesgo de descarga eléctrica, incendio o daños en el equipo, no enchufe conectores de teléfono o telecomunicaciones en este receptáculo.



これらの記号が貼付された RJ-45 ソケットは、ネットワーク インタフェース接続を表します。

警告：感電、火災、または装置の損傷を防止するために、電話または電気通信用のコネクタをこのソケットに接続しないでください。



Any surface or area of the equipment marked with these symbols indicates the presence of a hot surface or hot component. Contact with this surface could result in injury.

WARNING: To reduce the risk of personal injury from a hot component, allow the surface to cool before touching.



Deze symbolen geven een heet oppervlak of een heet onderdeel aan. Aanraking van dit oppervlak kan letsel veroorzaken.

WAARSCHUWING: Laat het oppervlak afkoelen voordat u het aanraakt, om het risico van brandwonden te beperken.



Apposés sur une surface ou une zone du matériel, ces symboles indiquent la présence d'une surface chaude ou d'un élément chaud. Tout contact avec cette surface présente des risques de brûlures.

AVERTISSEMENT : pour réduire les risques de brûlure, laissez refroidir la surface ou l'élément avant de le toucher.



Qualsiasi superficie o area dell'apparecchiatura contrassegnata da questi simboli indica la presenza di una superficie o di un componente a temperatura elevata. Il contatto con questa superficie può causare delle lesioni.

AVVERTENZA: Per evitare il rischio di ustioni, lasciare che la superficie si raffreddi prima di toccarla.



Wenn Oberflächen oder Bereiche eines Geräts mit diesen Symbolen gekennzeichnet sind, besteht dort Gefahr durch heiße Oberflächen oder Komponenten, deren Berührung zu Verletzungen führen kann.

VORSICHT: Lassen Sie solche Oberflächen vor dem Berühren abkühlen, um Verletzungen zu vermeiden.



Cualquier superficie o área del equipo donde aparezcan estos símbolos indica la presencia de una superficie o un componente a temperatura elevada. Cualquier contacto con esta superficie puede producir daños.

ADVERTENCIA: Para reducir el riesgo de sufrir quemaduras, deje enfriar la superficie de los componentes antes de tocarlos.



これらの記号が貼付された装置の表面または内部部品の温度が非常に高くなる可能性があることを示します。この表面に手を触れるとやけどをする場合があります。

警告：表面が熱くなっているため、やけどをしないように、システムの内部部品が十分に冷めてから手を触れてください。



Power supplies or systems marked with these symbols indicate the presence of multiple sources of power.

WARNING: To reduce the risk of personal injury from electrical shock, remove all power cords to completely disconnect power from the power supplies and systems.



Netvoedingseenheden of systemen met deze symbolen hebben meerdere voedingsbronnen.

WAARSCHUWING: Koppel alle netsnoeren van de voedingsbronnen en de systemen los om de voeding geheel uit te schakelen. Zo beperkt u het risico van lichamelijk letsel door elektrische schokken.



Apposés sur les unités ou systèmes d'alimentation, ces symboles indiquent que le matériel dispose de plusieurs sources d'alimentation.

AVERTISSEMENT : pour réduire le risque d'électrocution, débranchez tous les cordons d'alimentation afin de couper entièrement l'alimentation du système.



Gli alimentatori o i sistemi contrassegnati da questi simboli indicano la presenza di più sorgenti di alimentazione.

AVVERTENZA: Per ridurre il rischio di lesioni personali causate da scosse elettriche, rimuovere tutti i cavi in modo da scollegare completamente il sistema dall'alimentazione.



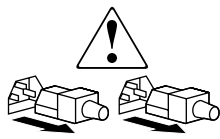
Diese Symbole auf Netzteilen oder Stromversorgungssystemen weisen darauf hin, dass das Gerät über mehrere Stromquellen versorgt wird.

VORSICHT: Ziehen Sie alle Netzkabel von den Netzteilen und Stromversorgungssystemen ab, um das System vollständig vom Stromnetz zu trennen und dadurch Verletzungen durch elektrischen Schlag zu vermeiden.



Las fuentes de alimentación o los sistemas marcados con estos símbolos indican que el equipo dispone de varias fuentes de alimentación.

ADVERTENCIA: Para reducir el riesgo de lesiones personales ocasionadas por descargas eléctricas, desconecte las fuentes de alimentación y los sistemas por completo extrayendo todos los cables de alimentación.



電源やシステムにこれらの記号が貼付されている場合は、装置の電源が複数あることを示します。

警告：感電しないように、電源コードをすべて抜き取ってシステムの電源を完全に切ってください。



Any product or assembly marked with these symbols indicates that the component exceeds the recommended weight for one individual to handle safely.

WARNING: To reduce the risk of personal injury or damage to the equipment, observe local occupational health and safety requirements and guidelines for manually handling material.



Deze symbolen geven aan dat het product of de assemblage te zwaar is om veilig door één persoon te kunnen worden gedragen.

WAARSCHUWING: Om het risico van persoonlijk letsel of schade aan de apparatuur te beperken, is het belangrijk dat u zich houdt aan de lokale gezondheids- en veiligheidsvoorschriften en richtlijnen voor het hanteren van materialen.



Apposés sur un produit ou un équipement, ces symboles indiquent que l'élément excède le poids maximal pouvant être manipulé en toute sécurité par une seule personne.

AVERTISSEMENT : pour réduire les risques de blessures ou de dégâts matériels, respectez les règles locales de santé et sécurité au travail en matière de manipulation du matériel.



I prodotti o i gruppi contrassegnati da questi simboli superano il peso consigliato affinché una sola persona sia in grado di maneggiarli in condizioni di sicurezza.

AVVERTENZA: Per ridurre il rischio di lesioni personali o danni alle apparecchiature, rispettare le norme sulla sicurezza del lavoro e le direttive in materia di manipolazione delle apparecchiature pesanti.



Mit diesen Symbolen gekennzeichnete Produkte oder Bauteile sind zu schwer, um von einer Person sicher bewegt zu werden.

VORSICHT: Beachten Sie die geltenden Sicherheitsvorschriften und Arbeitsschutzrichtlinien für die Handhabung schwerer Gegenstände, um die Gefahr von Verletzungen oder Beschädigungen des Geräts zu vermeiden.



Cualquier producto o componente marcado con estos símbolos indica que éste excede el peso recomendado para que una persona lo manipule de manera segura.

ADVERTENCIA: Para reducir el riesgo de lesiones personales o daños en el equipo, observe las directrices y requisitos de seguridad e higiene en el trabajo relativos al manejo de materiales.



製品や機械にこの 2 つの記号が貼付されている場合は、1 人で安全に取り扱うことができる重量を超えていることを表します。

警告： けがや装置の損傷を防ぐために、ご使用の地域で定められた重量のある装置の安全な取り扱いに関する規定に従ってください。

Getting help

If you still have a question after reading this guide, contact an HP authorized service provider or access our web site: <http://www.hp.com>.

HP technical support

Telephone numbers for worldwide technical support are listed on the following HP web site: <http://www.hp.com/support/>. From this web site, select the country of origin.

Note: For continuous quality improvement, calls may be recorded or monitored.

Be sure to have the following information available before calling:

- Technical support registration number (if applicable)
- Product serial numbers
- Product model names and numbers
- Applicable error messages
- Operating system type and revision level
- Detailed, specific questions

HP storage web site

The HP web site has the latest information on this product, as well as the latest drivers. Access storage at: <http://www.hp.com/country/us/eng/prodserv/storage.html>. From this web site, select the appropriate product or solution.

HP authorized reseller

For the name of your nearest HP authorized reseller:

- In the United States, call 1-800-345-1518
- In Canada, call 1-800-263-5868
- Elsewhere, see the HP web site for locations and telephone numbers: <http://www.hp.com>.

Library Overview



This chapter describes both the ESL E-Series tape library and its components. The chapter consists of:

- [Library components](#), page 18
- [Library models](#), page 41

Library components

The ESL E-Series tape library consists of the following major components:

- [Library cabinet](#), page 18
- [Operator control panel \(OCP\)](#), page 21
- [Media picker](#), page 23
- [Tape drives](#), page 24
- [Load ports and magazines](#), page 29
- [Card cage and controllers](#), page 30
- [Interface Manager card](#), page 38

Library cabinet

The cabinet houses all library components including:

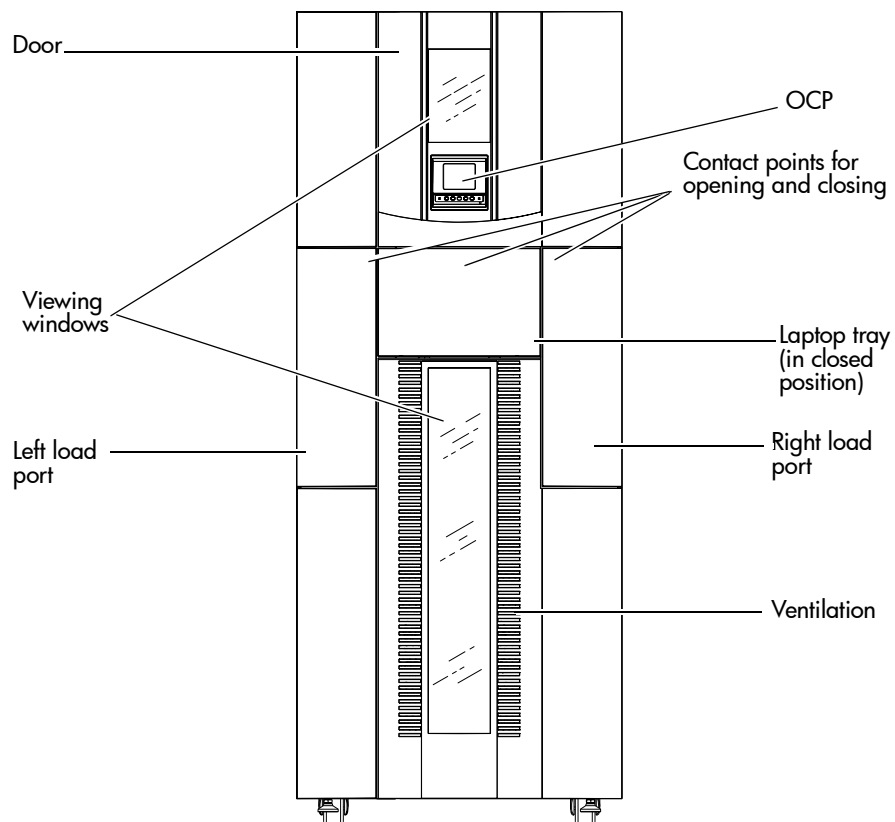
- Media picker
- Storage bins
- Control electronics
- Power supply and distribution equipment
- Tape drives
- Card cage with Fibre Channel interface controllers and robotics controller
- Interface Manager card

You can access these components through the front and back doors of the library cabinet.

Front panel

The front of the library cabinet (see [Figure 1](#)) provides the following:

- Front door provides easy access to the media picker and the storage array
- The viewing window makes it possible to visually monitor library operations
- An Operator Control Panel (OCP) in the center of the door enables you to monitor and control library operations
- 2 configurable load ports for easy insertion of cartridges without opening the library door.

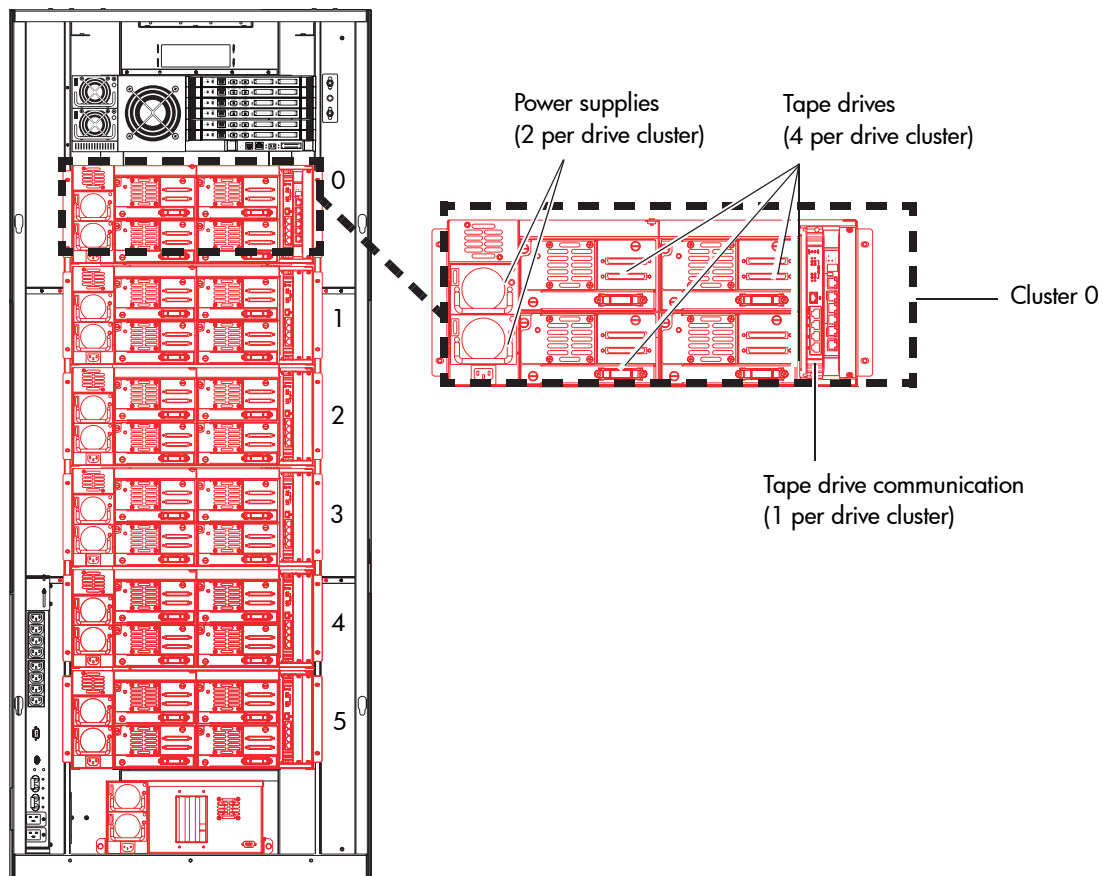
Figure 1: Library cabinet - front view

Back panel

The back of the cabinet (see [Figure 2](#)) provides easy accessibility to:

- Cooling fans
- Power, control, and data interfaces
- Tape drives
- Tape drive communication (cluster controller card and Interface Manager card)
- Card cage with Fibre Channel interface controllers and a robotics controller card

Figure 2: Library cabinet - back panels



Operator control panel (OCP)

The OCP features a menu system for determining library status, configuring the library, and performing certain diagnostic functions.

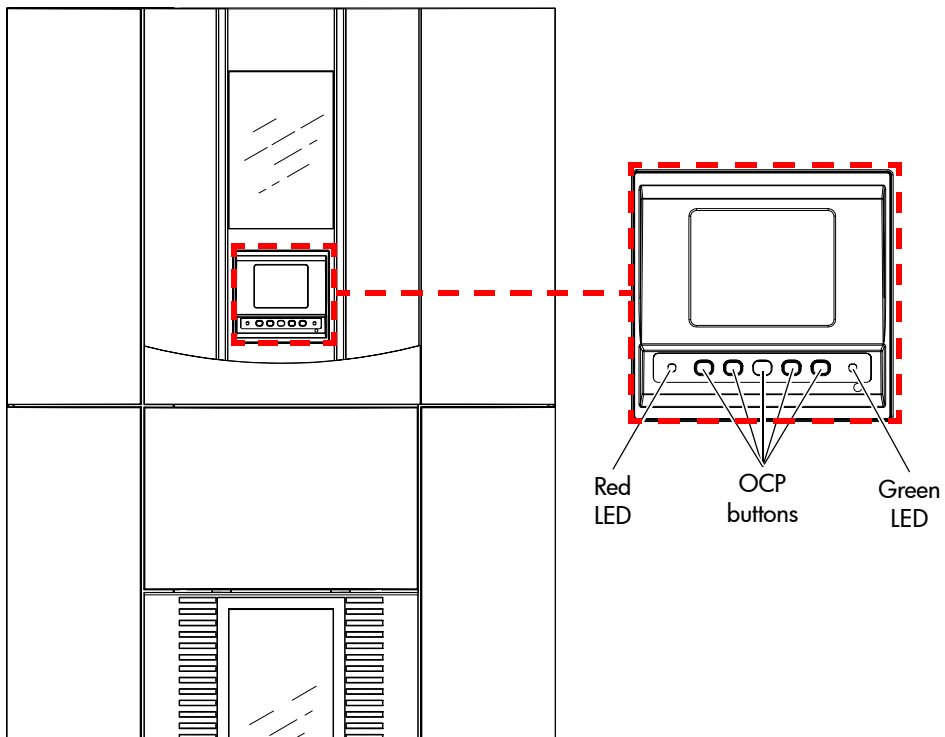
Note: You can also perform diagnostics using HP StorageWorks Library and Tape Tools, available from <http://www.hp.com/support/tapetools> (see page 86). Additionally, you can configure the library and monitor library status using HP StorageWorks Command View ESL that shipped with your product. For support information, visit <http://www.hp.com/support/cvesl>.

The OCP (see [Figure 3](#)) consists of the following features (see [Table 2](#)):

Table 2: OCP features

Feature	Description
Operator control panel	<p>The operator control panel consists of the following elements:</p> <ul style="list-style-type: none"> ■ OCP <p>The OCP displays library status information and allows you to access the library menus. These menus allow you to view or change the library settings, run demonstration programs, or run diagnostic tests.</p> <p>The OCP is discussed in “Library Operations” on page 51.</p> ■ Five OCP buttons <p>Use these buttons in combination with the OCP to scroll through screens and select options or commands. The functionality of these buttons changes depending on the currently displayed GUI screen.</p> ■ Light emitting diode (LED) indicators <p>The operator control panel has two LED indicators:</p> <ul style="list-style-type: none"> — The green LED lights when the library is fully operational and ready to accept host commands. It flashes while the library is transitioning from a READY state to a NOT READY state. The library will not be READY during power-on self-tests, when magazines are being released, or during access to certain menu items. — The red LED lights when there is a library error. — Both LEDs flash when there is a library fault that requires operator attention.

Figure 3: GUI—initial screen

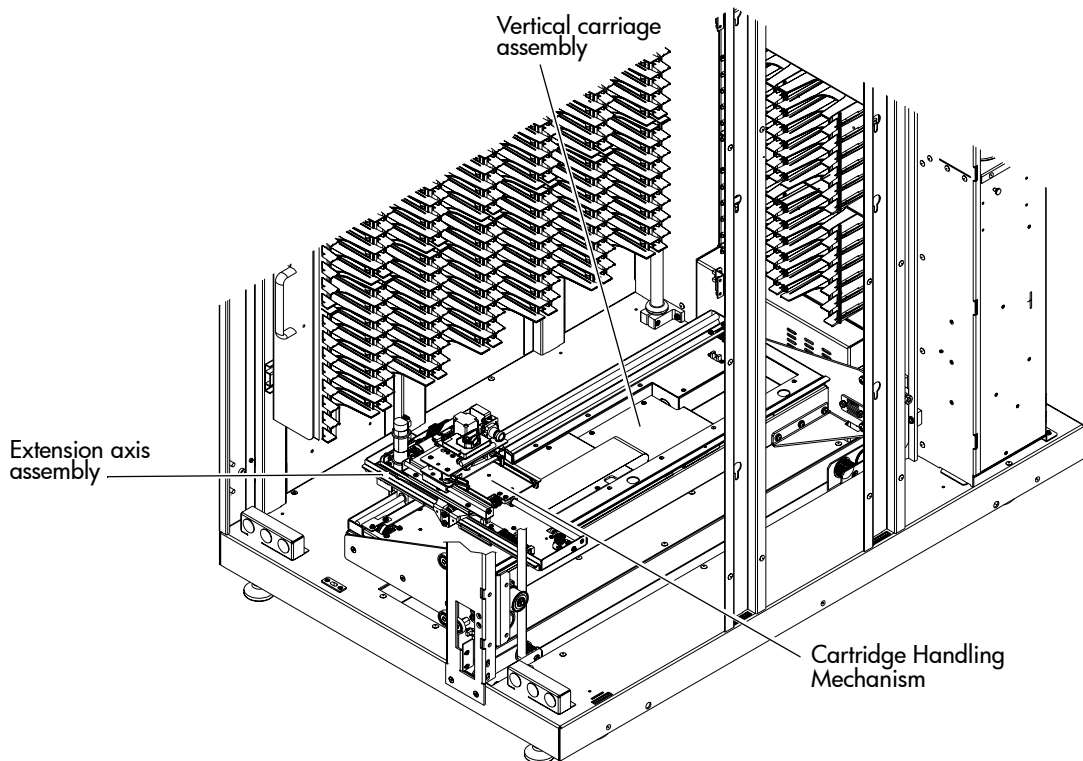


Media picker

The media picker consists of the following components:

- Picker assembly
- Vertical carriage assembly
- Horizontal drive motor
- Extension axis assembly

Figure 4: Picker



The vertical and horizontal actuators move the media picker into position to pick and place tape cartridges. The rotary actuator rotates the media picker 180°, allowing the media picker to pass cartridges between the side storage bins and the back storage bins or tape drives. The extension actuator extends the media picker forward to make contact with the desired cartridge and then retracts the media picker to remove the cartridge from a bin or drive.

The media picker includes an optical scanner that reads bar code labels (7 characters for SDLT and 8 characters for Ultrium). The scanner is used to maintain an inventory of the tape cartridges within the library. A full inventory occurs automatically whenever the library is turned on or when the doors have been opened. An inventory of the load ports only occurs when the load ports have been opened. Inventories can also be initiated from the host computer.

Although the library does not require tape cartridges to have bar code labels, properly labeled tape cartridges and full storage bins speed up the inventory process.

Tape drives

The ESL E-Series tape library can hold up to 24 Ultrium 460 or SDLT 320 tape drives. When fewer than 24 drives are installed in the library, the tape drives must occupy consecutive drive clusters, beginning with drive cluster 0 (see [Figure 2](#) on page 20).

Note: By default, Autoclean is disabled. Ensure your application software supports this feature before enabling it.

If a drive experiences read/write errors when the AutoClean function is enabled, the library issues an error message stating that drive cleaning is required. Without user intervention, the media picker replaces the data cartridge with a cleaning cartridge. When the cleaning procedure finishes, the media picker returns the data cartridge to the drive.

Note: When a cleaning cartridge has completed its use limit, it is automatically exported from the library, requiring a new one to be loaded through the load port. Ultrium cleaning cartridges have a 50-use limit, while SDLT cleaning cartridges have a 20-use limit.



Caution: It is critical to ensure that the media you use matches the format of your tape drive. Cleaning cartridges and formatted data cartridges are unique for each drive technology. Damage may occur if inappropriate media is used in tape drives.

Ultrium 460 tape drives

The Ultrium tape drive is a high-performance streaming tape drive that uses Linear Tape-Open (LTO) technology. An Ultrium 460 tape drive is capable of storing up to 200 GB (native) of data per cartridge. Access the *HP StorageWorks Ultrium Tape Drive User's Guide* from <http://www.hp.com/support> for more information about its features and capabilities.

Table 3: Ultrium 460 Tape Drive Capacity and Data Transfer Rate

Data Capacity	Sustained Data Transfer Rate
200 GB (native)	30 MBps (108 GBph)

Ultrium 460 tape cartridges

Note: In addition to the information provided in this manual, refer to the documentation provided with your media for more information.



Caution: Ultrium tape drives require special cleaning cartridges and data cartridges formatted specifically for HP Ultrium. To avoid damage to your tape drive, it is critical to use appropriate cleaning cartridges and properly formatted data cartridges.

Approved media will have the Ultrium format trademark, which indicates that the media has passed Ultrium format compliance testing (see [Figure 5](#)).



Figure 5: HP Ultrium format trademark

For best results, always use HP branded media and bar code labels. The following tape cartridges and label packs are approved for the library's Ultrium tape drives (capacity listed assumes 2:1 compression):

- HP Ultrium Data Cartridge:
 - C7972A (400 GB, Ultrium 460)
 - C7971A (200 GB, Ultrium 230)
- HP Ultrium 460 Prelabeled Data Cartridge:
 - C7972L (400 GB, Europe Only, Ultrium 460)
 - C7972AL (400 GB, Americas Only, Ultrium 460)
 - C7971L (200GB, Europe Only, Ultrium 230)
 - C7971AL (200 GB, Americas Only, Ultrium 230)
- HP Ultrium Bar Code Label Pack:
 - Q2002A (Ultrium 460)
 - Q2001A (Ultrium 230)
- HP Ultrium Universal Cleaning Cartridge:
 - C7978A



Caution: Do not bulk erase Ultrium formatted cartridges. This will destroy prerecorded servo information and make the cartridge unusable.

Make it a practice to visually inspect your tape cartridges when loading or removing them from your tape library. Taking a few minutes to check the condition of your cartridges will lower the risk of repeated failures and help ensure uninterrupted backup. See [Maintaining Tape Cartridges](#) on page 98 for general precautions when using tape cartridges.



Caution: Always discard damaged tape cartridges. If a defective tape cartridge is loaded into a tape drive, it may in turn damage the drive, potentially requiring drive replacement.

Note: For information on ordering tape cartridges and bar code labels, refer to the ordering sheet that shipped with your library. You can also access this information at <http://www.hp.com>.

SDLT 320 tape drives

The SDLT 320 tape drive is a high-capacity, high-performance streaming tape drive that uses Laser Guided Magnetic Recording (LGMR) technology to maximize the amount of data that can be stored on a tape. An SDLT 320 tape drive is capable of storing up to 160 GB (native) of data per cartridge. Access the *HP StorageWorks SDLT Tape Drive Reference Guide* from <http://www.hp.com/support> for more information about its features and capabilities.

Table 4: SDLT 320 Tape Drive Capacity and Data Transfer Rate

Data Capacity	Sustained Data Transfer Rate
160 GB (native)	16 MBps (57.6 GBph)

SDLT 320 tape cartridges

Note: In addition to the information provided in this manual, refer to the documentation provided with your media for more information.

The following tape cartridges and label packs are approved for the library's SDLT tape drives (capacity listed assumes 2:1 compression):

- HP SDLT Data Cartridge:
 - C7980A (220-320 GB)
- HP SDLT Prelabeled Data Cartridge:
 - C7980L (220-320 GB, Europe Only)
 - C7980AL (220-320 GB, Americas Only)
- HP SDLT Cleaning Cartridge:
 - C7982A
- HP SDLT Bar Code Label Pack:
 - Q2003A



Caution: SDLT tape drives require special cleaning cartridges and data cartridges formatted specifically for SDLT. To avoid damage to your tape drive, it is critical to use appropriate cleaning cartridges, and properly formatted data cartridges. Do not use DLT Tape I, DLT Tape II, DLT Tape III, or DLT Tape IIIXT data cartridges, or DLT cleaning cartridges with SDLT tape drives.

Make it a practice to visually inspect your tape cartridges when loading or removing them from your tape library. Taking a few minutes to check the condition of your cartridges will lower the risk of repeated failures and help ensure uninterrupted backup. See [Maintaining Tape Cartridges](#) on page 98 for more information.



Caution: Always discard damaged tape cartridges. If a defective tape cartridge is loaded into a tape drive, it may in turn damage the drive, potentially requiring drive replacement.

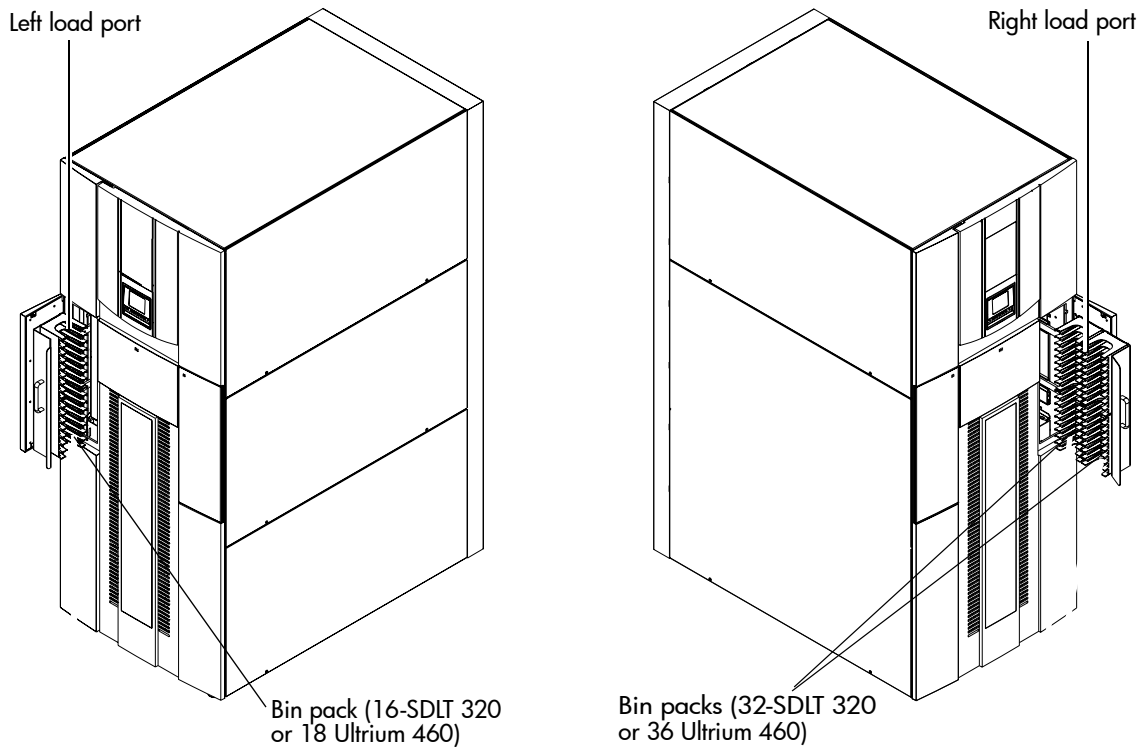
Note: For information on ordering tape cartridges and bar code labels, refer to the ordering sheet that shipped with your library.

Load ports and magazines

The load ports are mechanical devices in the front panel of the library that enable you to import or export tape cartridges to and from the library via three tape cartridge magazines without interrupting library operations.

Each SDLT load port uses six stationary 8-bin tape cartridge magazines and each Ultrium 460 load port uses six stationary 9-bin tape cartridge magazines (see [Figure 6](#)).

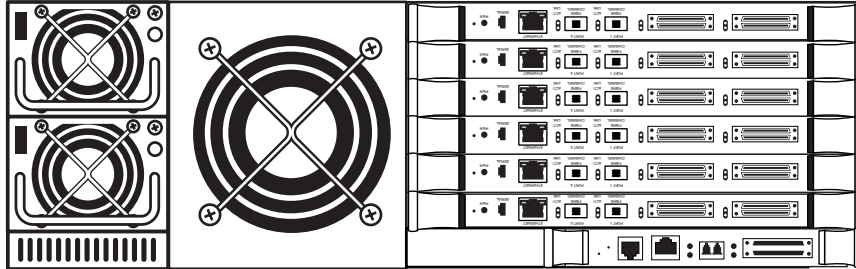
Figure 6: Load ports (left and right)



Card cage and controllers

The library card cage houses the library robotics controller (e1200-160) and up to six Fibre Channel interface controllers (e2400-160). The card cage, robotics controller card (e1200-160), and interface controllers (e2400-160) are located in the top of the library cabinet (see [Figure 7](#)).

Figure 7: Card cage with controllers



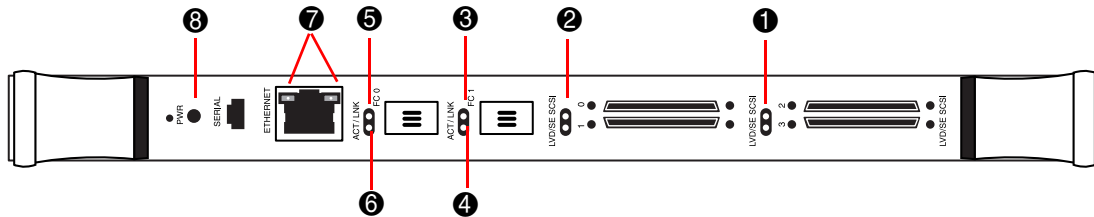
e2400-160 Fibre Channel interface controller

The e2400-160 Interface Controller provides bidirectional connectivity for Ultra-3 SCSI buses in a Fibre Channel Switched Fabric (FC-SW) environment.

Note: For information on installing the HP StorageWorks Fibre Channel Interface Controller, refer to the *HP StorageWorks ESL E-Series Unpacking and Installation Guide*, or the documentation that shipped with the interface controller.

[Figure 8](#) illustrates the I/O panel of the interface controller.

Figure 8: e2400-160 interface controller



❶	SCSI bus activity LEDs (on corresponding ports, 0, 1)
❷	SCSI bus activity LEDs (on corresponding ports, 2, 3)
❸	Fibre Channel Link LED on Port 0
❹	Fibre Channel Activity on Port 0
❺	Fibre Channel Link LED on Port 1
❻	Fibre Channel Activity LED on Port 1
❼	Ethernet Activity and Link LEDs
❽	Power LED

Reset Button

The FC interface controller has a reset button that can be used to force a manual reboot of the FC interface controller. To select this option, a pen or other small object is required to press the button. You can also select the Reboot menu option from the User Interface configuration menus, as described later in this manual.



Caution: Selecting the Reset button during an ongoing data backup, restore, or other data transfer process can result in a disruption of that process and a loss of data. Before selecting the Reset button, it is strongly recommended to verify that no data is currently transferring through the FC interface controller by visually inspecting the Activity LEDs of all I/O ports on the FC interface controller.

Power Indicator

The FC interface controller has one power LED.

Power indicator LED definition:

Green - Power has been applied to this module

Yellow - Power-On-Self-Test (POST) in process or processor problems

Serial Port

The FC interface controller is equipped with one serial port. See [Figure 8](#) for the location of the serial port.

Note: The serial port is an HP service port not intended for customer use.

Ethernet Port

One Ethernet port with an LED indicator is included in the FC interface controller. See [Figure 8](#) for the location of the Ethernet port.

Ethernet port LED definition:

Activity - Port activity

Link - Valid Ethernet link

Fibre Channel Port

Two Fibre Channel ports with LED indicators are found on the FC interface controller: Port 0 and Port 1. See [Figure 8](#) for the location of the Fibre Channel ports.

Fibre Channel LED definition:

Green (ACT) - Fibre Channel port activity

Green (LINK) - Valid Fibre Channel link

SCSI Buses

Four SCSI buses with LED indicators are included in the FC interface controller. See [Figure 8](#) for the location of the SCSI buses.

SCSI bus LED definition:

Green - SCSI bus activity on corresponding port

Functional Overview

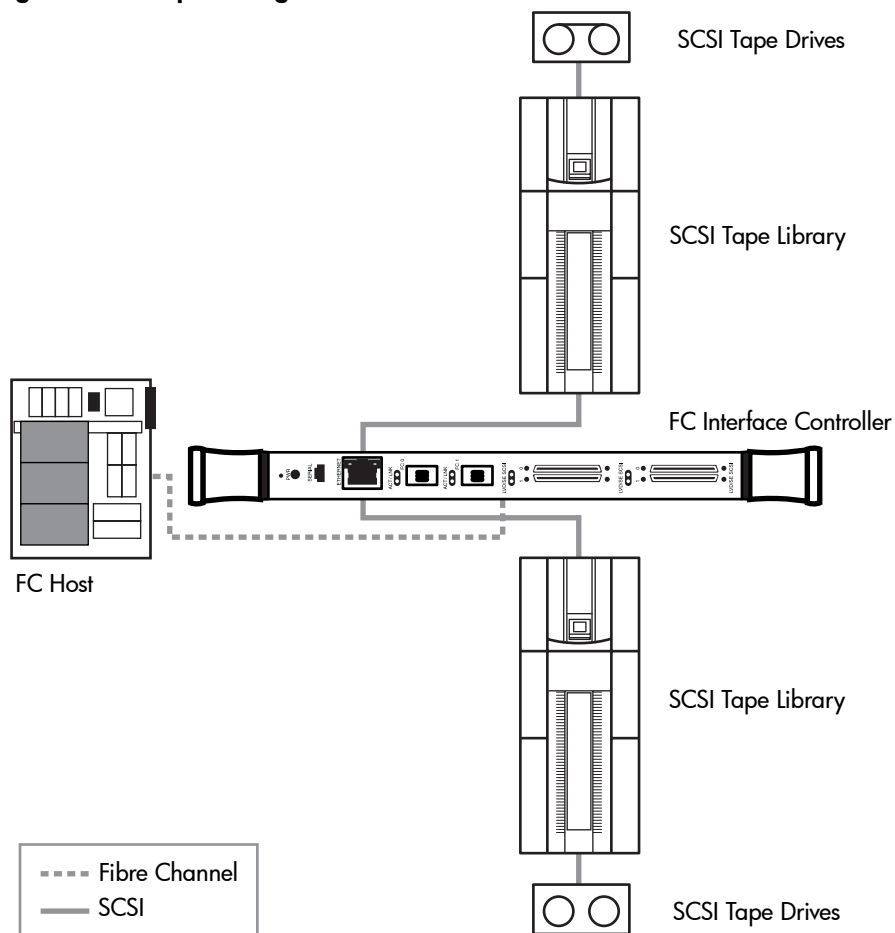
The FC interface controller translates the Fibre Channel Protocol (FCP) to and from the SCSI Protocol. It transfers commands, data, and status information to and from Fibre Channel controllers and SCSI devices.

Supported devices include:

- Initiator Devices – Fibre Channel hosts
- Direct Access Devices – RAID Controllers, disk drives, JBODs
- Sequential Access Devices – Tape drives
- Changer Devices – Tape and Magneto-Optical Libraries

The FC interface controller provides multiple Fibre Channel to SCSI I/O configurations.

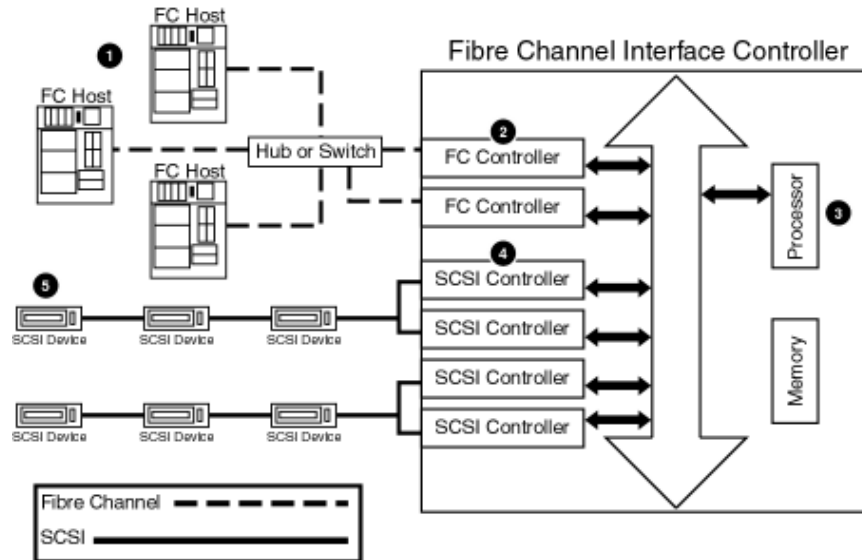
A sample configuration is illustrated in [Figure 9](#).

Figure 9: Example configuration

Fibre Channel to SCSI Protocol Process

This section describes the steps the FC interface controller uses to convert Fibre Channel host protocol to SCSI device protocol. [Figure 10](#) illustrates and defines this process.

Figure 10: Converting Fibre Channel to SCSI



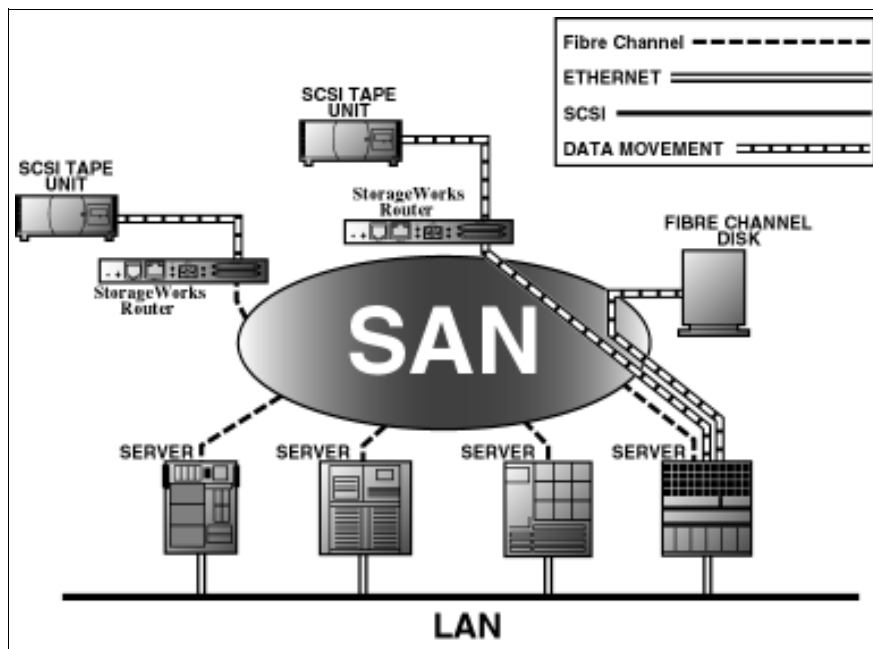
①	A FC host issues an encapsulated FC protocol command packet to the FC interface controller.
②	The FC interface controller interprets the Fibre Channel information, and places the packet in buffer memory.
③	The FC interface controller interprets the Fibre Channel information packet and programs the FC interface controller SCSI controller to process the transaction.
④	The FC interface controller SCSI controller sends the command to the SCSI device (target).
⑤	The SCSI target interprets the command and executes it.

LAN-free Backup and Restore

The FC interface controller can enable LAN-free backup/restore to allow the bulk of data traffic to be moved from the LAN to the storage area network (SAN).

See [Figure 11](#) for an illustration of this process.

Figure 11: LAN-free backup and restore



Fibre Channel Interface Controller Default Ethernet Settings

Some of the basic factory default values are:

- IP address: `http://1.1.1.1/`
- Subnet mask: `255.255.255.0`
- Gateway address: `0.0.0.0`
- User name: `<root>`
- Password: `<password>`

All settings within the FC interface controller configuration are preset with default values. These values are set to allow the FC interface controller to be installed into most HP environments with little or no configuration changes.

After changing the basic default values listed above, carefully consider any additional configuration changes.

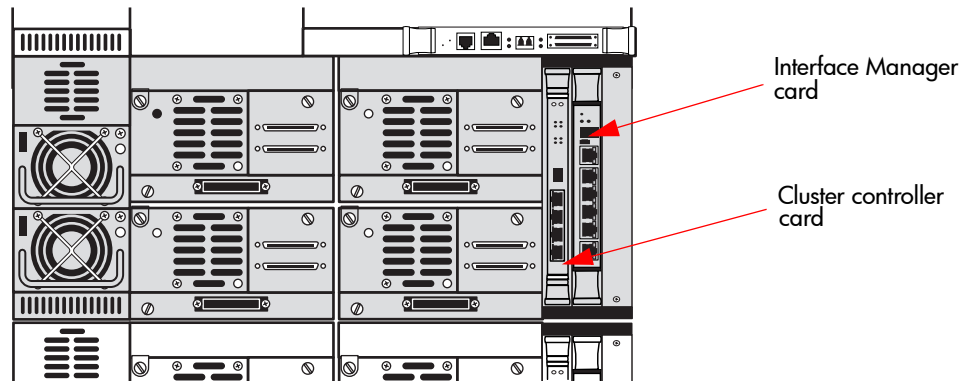
After the initial configuration of the FC interface controller is established, HP recommends backing up the configuration to an external file. During a recovery process, this file can be restored back to the FC interface controller, if needed.

Interface Manager card

The HP StorageWorks Interface Manager is a management card designed to consolidate and simplify the management of multiple Fibre Channel interface controllers installed in the library. It also provides SAN-related diagnostics and management for library components including interface controllers, drives, and robotics. The Interface Manager card, in conjunction with HP StorageWorks Command View ESL software, provides remote management of the library via a serial, telnet, or web-based GUI interface.

The Interface Manager card is located in drive cluster 0 to the right of the cluster controller card (see [Figure 12](#)).

Figure 12: Interface Manager card



Note: Additional advanced SAN security and management features are available via permanent software licenses. For more information, refer to the documentation that shipped with the Interface Manager and Command View ESL software kit. Details are also available at <http://www.hp.com/support/cvesl>.

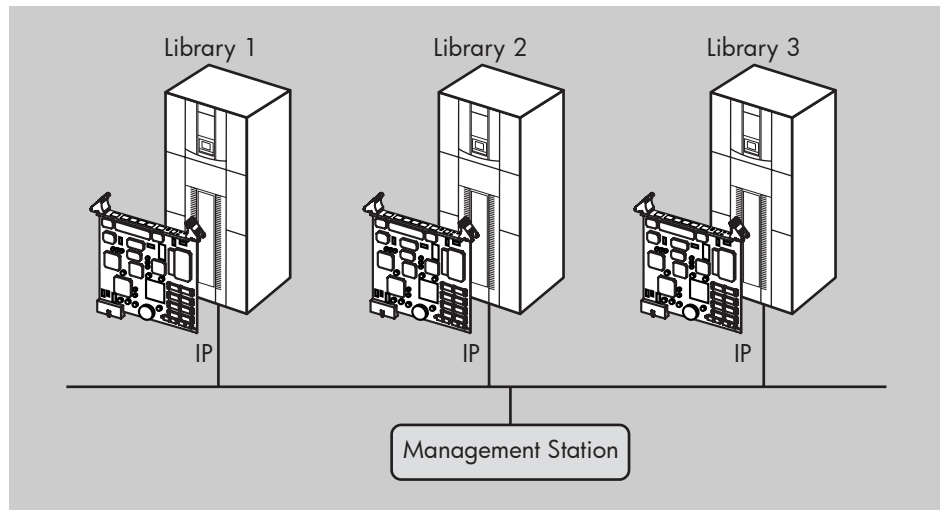
Note: Command View ESL, provided with your library, is a utility that provides diagnostics and management by accessing devices through a LAN infrastructure. For more information on Command View ESL, go to <http://www.hp.com/support/cvesl>. HP StorageWorks Library and Tape Tools (L&TT) is a utility that accesses devices across a Fibre Channel infrastructure. For more information on L&TT, go to <http://www.hp.com/support/tapetools>.

Architectural concepts

The Interface Manager communicates with the management station over the LAN. The management station is a Microsoft® Windows-based PC (server) that hosts the Command View ESL software. Ideally, the management station should have a static IP address and be dedicated for use with the Interface Manager and Command View ESL software.

Note: For information on using the Command View ESL software, see the *HP StorageWorks Interface Manager and Command View ESL User Guide* that shipped with your library or visit <http://www.hp.com/support/cvesl>.

Any client machine on the LAN can communicate with the Interface Manager either through the GUI web interface, or through a Telnet command line interface (CLI). At a higher level, multiple libraries, each containing an Interface Managercard, can be connected to a single management station. Each Interface manager card can communicate with only one management station, but the management station can communicate with multiple Interface Manager cards (see [Figure 13](#)).

Figure 13: Multiple libraries connected to a single management station

Tip: HP recommends that you install Command View ESL on a single server (management station) on the LAN. However, it is possible to install Command View ESL on multiple servers. In this scenario, if one management station claims a library for management, then that same library cannot be managed by any other management station. A library can only be managed by one management station at a time.

Library models

The HP StorageWorks ESL E-Series tape library is an automated tape storage and retrieval library that may consist of up to 24 tape drives and up to 718 Ultrium 460 or 636 SDLT 320 tape cartridges.

Model 712e

The library stores tape cartridges in the following locations:

- Left panels
- Right panels
- Back panels

Note: The number of tape cartridge slots depends on the drive technology used. The number of back panel slots depends on how many drive clusters are in the library.

Table 5: Ultrium library storage elements

Load ports used	Magazine type	Load port capacity	User slots ¹
0	Fixed	0	718
Left only	Fixed	18	700
Right only	Fixed	36	682
Both	Fixed	54	664

1. The total user slots were calculated based on the library having one drive cluster and five back panels installed.

Note: If the load ports are configured, those slots cannot be used as data slots.

To slide the slot panels out of the cabinet, press the slot panel latches down and pull the slot panel out of the cabinet (see [Figure 14](#)).

Figure 14: Sliding the slot panels out of the cabinet

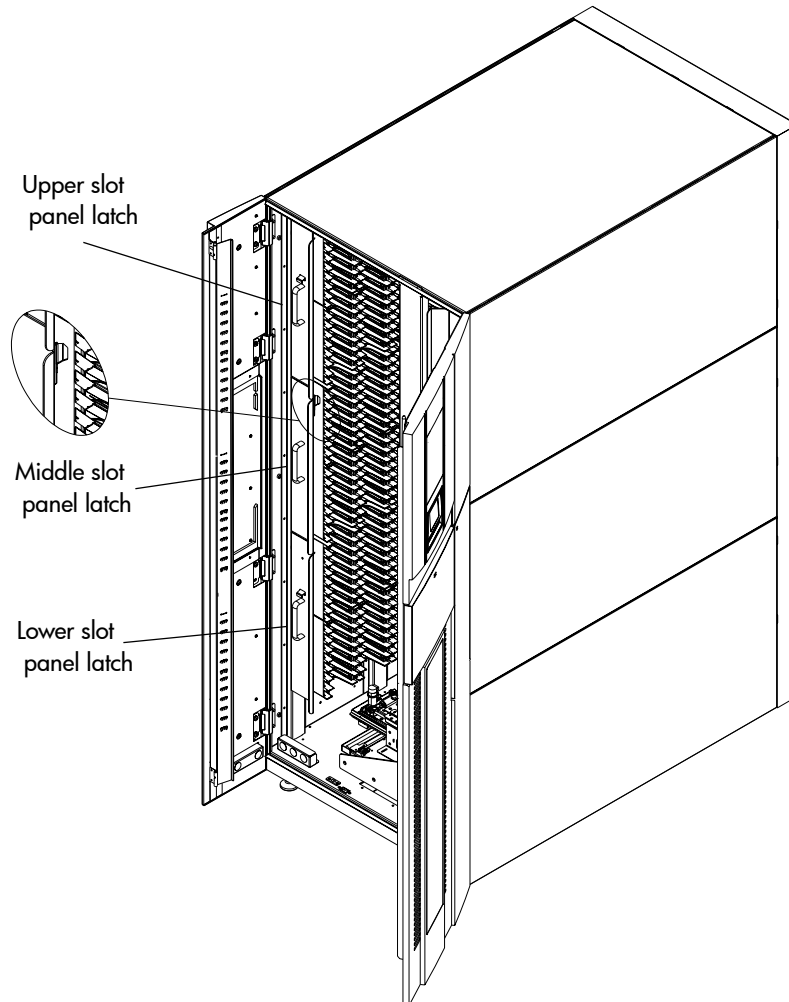


Figure 15 shows the left panel bins. Begin with panel 1 and load left to right and top to bottom. Continue with panel 2 in the same manner, and finally, panel 3.

Figure 15: Bin shelf numbering, Ultrium 460 (left panels)

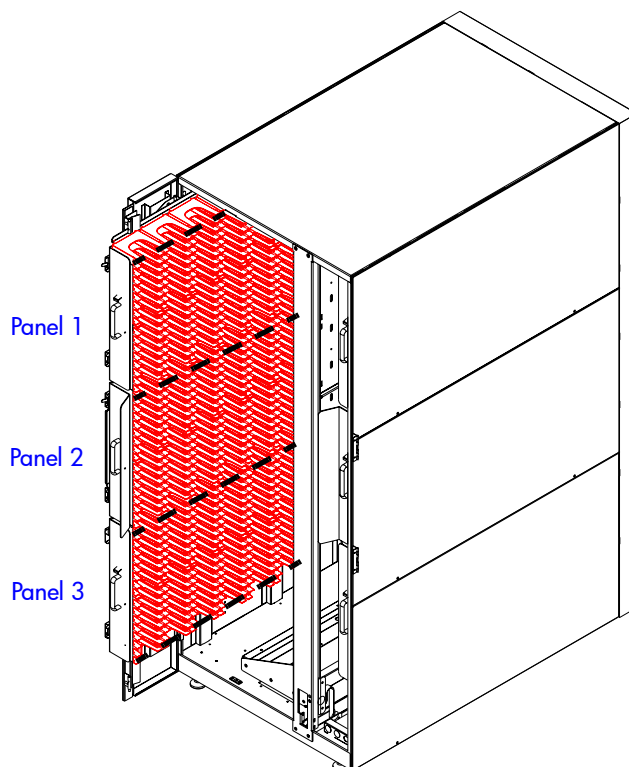


Figure 16 shows the right panel bins. Begin with panel 4 and load left to right and top to bottom. Continue with panel 5 in the same manner, and finally, panel 6.

Figure 16: Bin shelf numbering, Ultrium 460 (right panels)

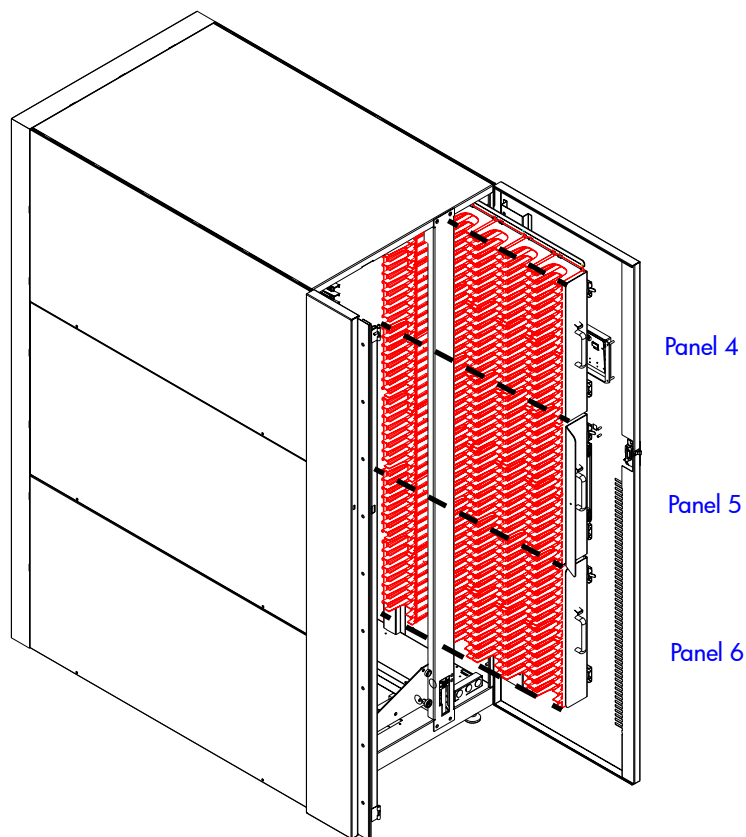
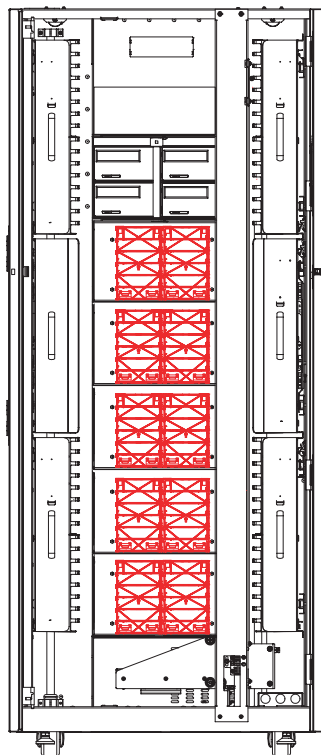


Figure 17 shows the back panel bins. Each column has seven slots.

Note: The number of slots located in the back panel varies with the number of drive clusters installed.

Figure 17: Bin shelf numbering, Ultrium 460 (back panel)



Model 630e

The library stores tape cartridges in the following locations:

- Left panels
- Right panels
- Back panels

Note: The number of tape cartridges slots depends on the drive technology used. The number of back panel slots depends on how many drive clusters are in the library.

Table 6: SDLT library storage elements

Load ports used	Magazine type	Load port capacity	User slots ¹
0	Fixed	0	636
Left only	Fixed	16	620
Right only	Fixed	32	604
Both	Fixed	48	588

1. The total user slots were calculated based on the library having one drive cluster and five back panels installed.

To slide the slot panels out of the cabinet, press the slot panel latches down and pull the slot panel out of the cabinet (see [Figure 14](#)).

Figure 18: Sliding the slot panels out of the cabinet

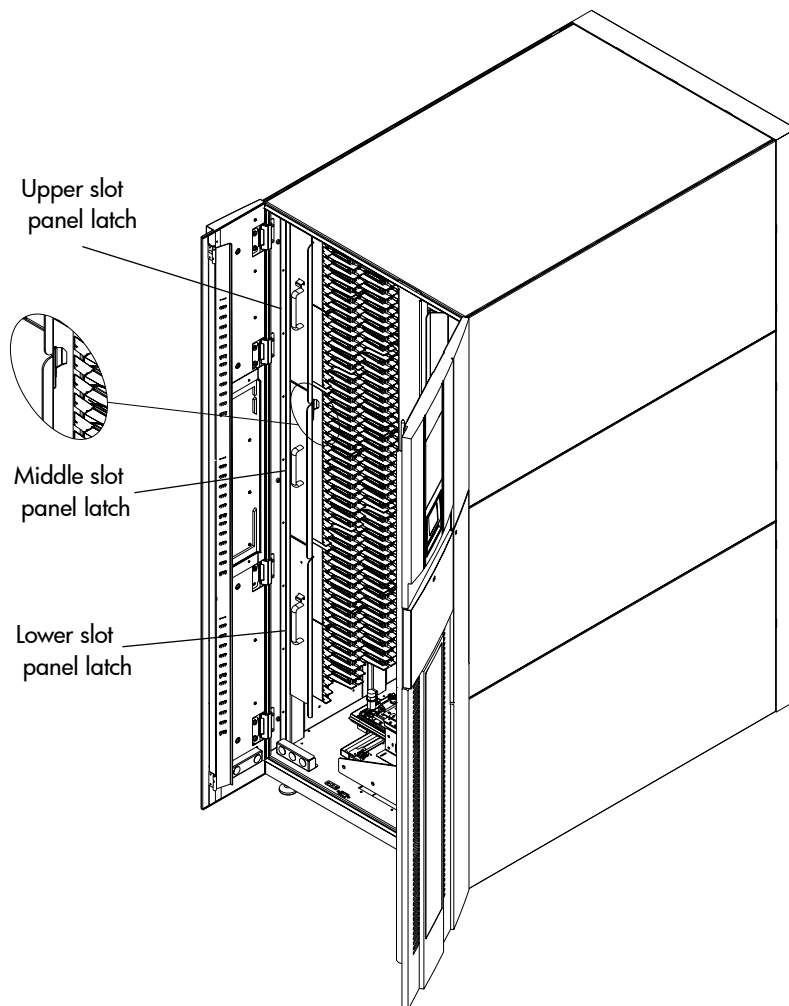


Figure 19 shows the left panel bins. Begin with panel 1 and load left to right and top to bottom. Continue with panel 2 in the same manner, and finally, panel 3.

Figure 19: Bin shelf numbering, SDLT (left panels)

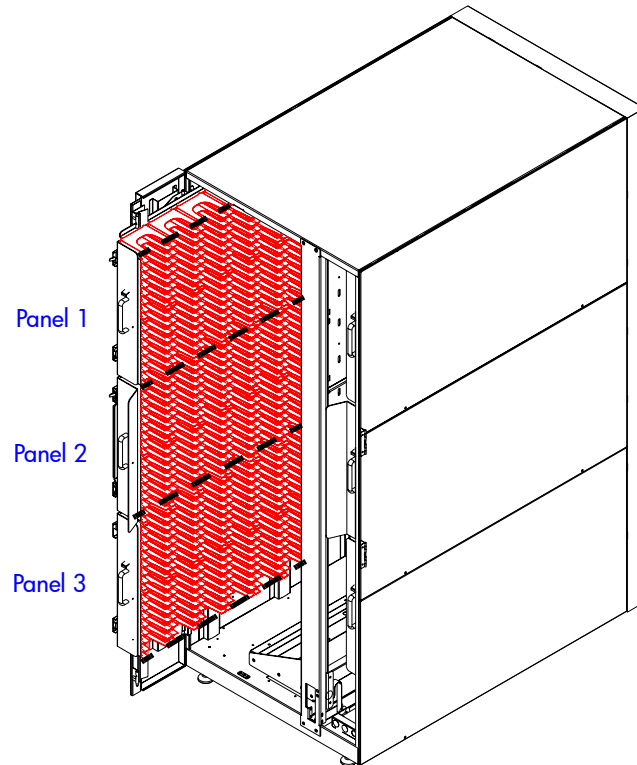


Figure 20 shows the right panel bins. Begin with panel 4 and load left to right and top to bottom. Continue with panel 5 in the same manner, and finally, panel 6.

Figure 20: Bin shelf numbering, SDLT (right panels)

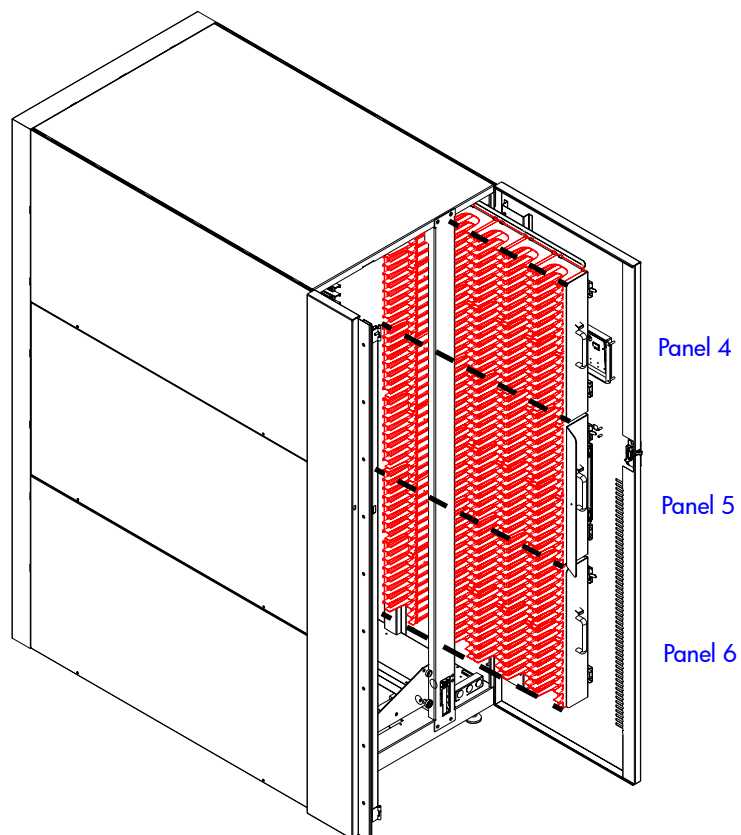
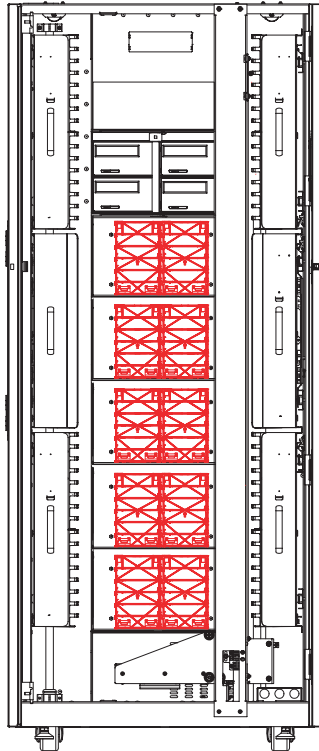


Figure 21 shows the back panel bins and their numbering conventions.

Note: The number of slots located on the back panel varies with the number of drive clusters installed. Each column has six slots.

Figure 21: Bin shelf numbering, SDLT (back panel)



Note: The number of slots located on the back panel varies with the number of drive clusters installed.

Library Operations

2

This chapter describes the following basic library operating procedures:

- [Preparing tape cartridges](#), page 52
- [Installing tape cartridges](#), page 59
- [Closing the cabinet doors and access panels](#), page 64
- [Turning the library on and off](#), page 66
- [Using the OCP](#), page 68
- [Inserting tape cartridges into the load port](#), page 83

Preparing tape cartridges



Caution: Handle tape cartridges with care. Do not drop or mishandle them, or place them near sources of electromagnetic interference. Rough handling can damage the cartridge, making it unusable and potentially hazardous to the tape drives.

Labeling tape cartridges



Caution: The misuse and misunderstanding of bar code technology can result in backup and restore failures. To ensure that your bar codes meet HP's quality standards, always purchase them from an approved supplier and never print bar code labels yourself. For more information, refer to the order form provided with the library, as well as the *Bar Code Label Requirements, Compatibility and Usage* white paper available from <http://www.hp.com/support>.

Note: For information on ordering tape cartridges and bar code labels, refer to the ordering sheet that shipped with your library.

Attaching a bar code label to each tape cartridge enables the library and application software to identify the cartridge quickly, thereby speeding up inventory time. Make it a practice to use bar code labels on your tape cartridges. Your host software may need to keep track of the following information and the associated bar code:

- Date of format or initialization
- Tape's media pool
- Data residing on the tape
- Age of the backup
- Errors encountered while using the tape (to determine if the tape is faulty)

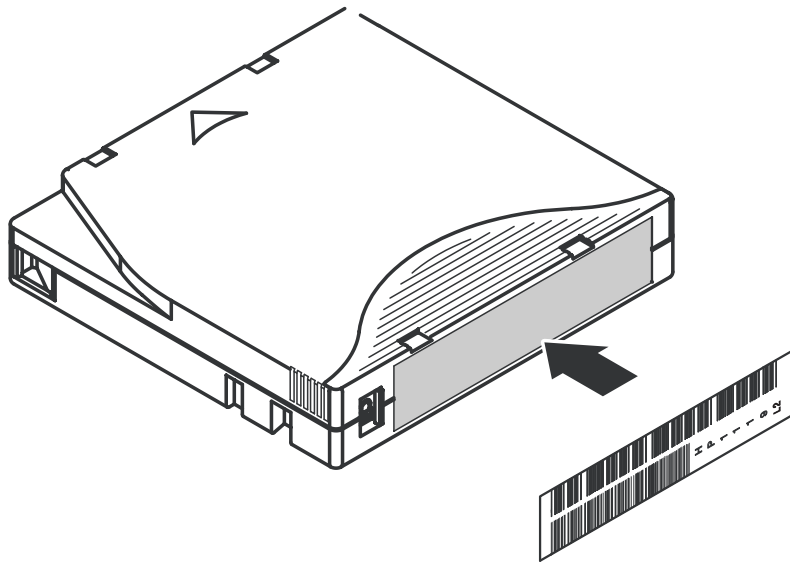
Ultrium bar code labels

Ultrium cartridges have a recessed area located on the face of the cartridge next to the write-protect switch. Use this area for attaching the adhesive-backed bar code label (see [Figure 23](#)). Do not apply labels onto the cartridge except in this designated area.



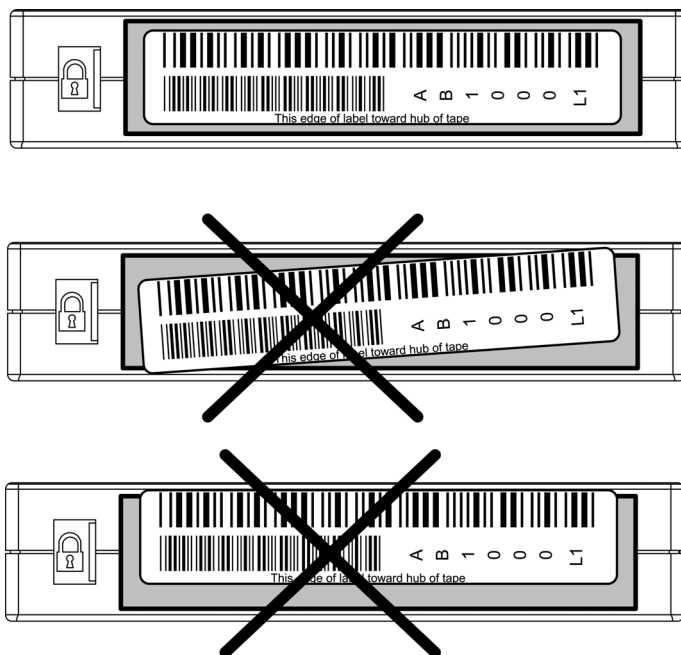
Caution: The bar code label should be applied as shown in [Figure 25](#) with the alphanumeric portion facing the hub side of the cartridge. Never apply multiple labels onto a cartridge, because extra labels can cause the cartridge to jam inside a tape drive.

Figure 22: Attaching an Ultrium bar code label



For successful operation of your tape library, place the bar code label *entirely* within the recessed area, ensuring that no part of the label is outside of it (see [Figure 23](#)).

Figure 23: Proper Ultrium bar code label placement



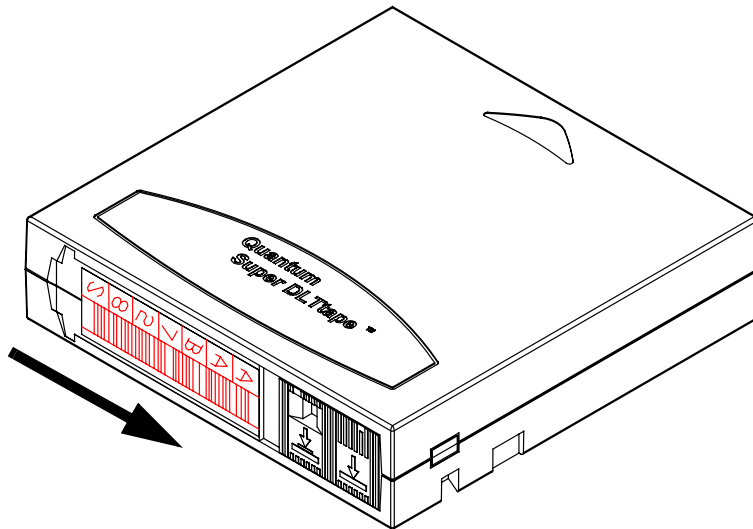
SDLT bar code labels

SDLT cartridges have a front slide slot located on the face of the cartridge next to the write-protect switch (see [Figure 24](#)). Use this slot for inserting the bar code label by sliding it into the slot.



Caution: Do not apply labels onto the top, bottom, sides, or back of the cartridge as this may cause damage to the tape drive, or interfere with reliable operation.

Figure 24: Inserting an SDLT bar code label



Media label identifiers

Be sure to use the proper bar code labels for your drive technology. [Table 7](#) lists the identifier that is found at the end of 7- or 8-character SDLT and Ultrium bar code labels.



Caution: To ensure that your bar codes meet HP's quality standards, always purchase them from an approved supplier and never print bar code labels yourself. For more information, refer to the order form provided with the library, as well as the *Bar Code Label Requirements, Compatibility and Usage* white paper available from <http://www.hp.com/support>.

Table 7: Media Label Identifiers

Cartridge Type	Density	Label Identifier
SDLT	110/220 GB	S or S1
SDLT	160/320 GB	S or S2
Ultrium 230	100/200 GB	L1
Ultrium 460	200/400GB	L2

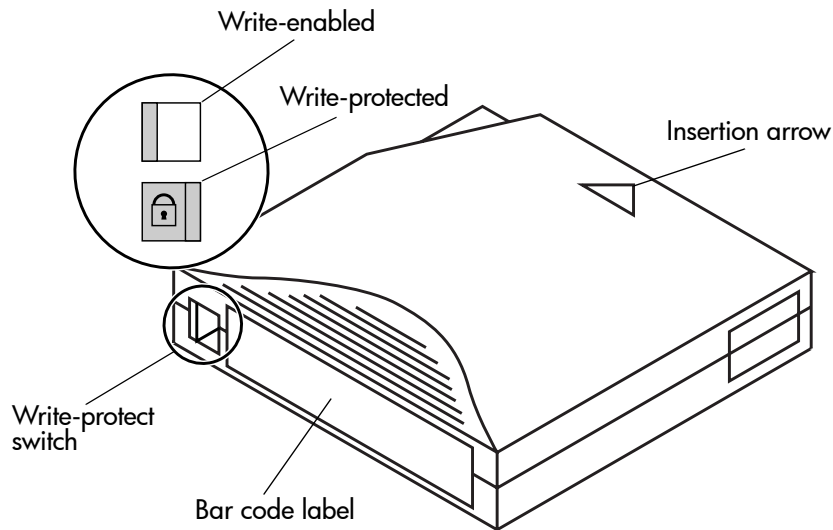
Setting the write-protect switch

Each tape cartridge has a sliding write-protect switch. This switch determines whether new data can be written to the tape cartridge (write-enabled) or whether data on the tape cartridge is protected from being erased or overwritten (write-protected).

Write-Protecting Ultrium tape cartridges

By moving the switch to the left ([Figure 25](#)), the tape cartridge is write-enabled. By moving the switch to the right ([Figure 25](#)), the tape cartridge is write-protected.

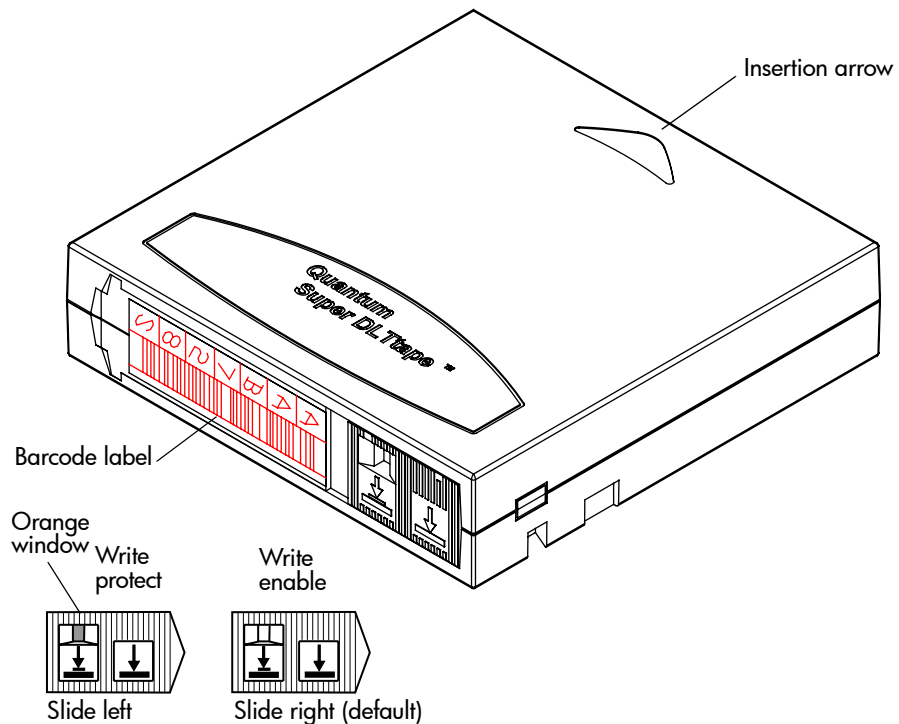
Figure 25: Write-protecting Ultrium tape cartridges



Write-protecting SDLT tape cartridges

By moving the switch to the left (Figure 26), the tape cartridge is write-protected (orange indicator is visible). By moving the switch to the right (Figure 26), the tape cartridge is write-enabled (orange indicator is not visible).

Figure 26: Write-protecting SDLT tape cartridges



Installing tape cartridges

Load tape cartridges into the library starting with the left side panels, then the right side panels, and finally the back panel (see “[Library models](#)” on page 41 for detailed installation procedures). Be sure all cartridges are properly oriented with the barcode facing you and that they are fully seated in the bins.



Caution: Handle tape cartridges with care. Do not drop or bang them, or place them near sources of electromagnetic interference. Rough handling can displace the tape leader, making the cartridge unusable and potentially hazardous to the tape drives.

Taking ESD precautions

Components within the library contain static-sensitive parts. To prevent damage to these parts while performing installation, maintenance, or replacement procedures, observe the following precautions:

- Keep the cabinet turned off during all installation, maintenance, and replacement procedures.
- Keep the cabinet power cord connected to a grounded power outlet except when working with AC electrical components.



WARNING: This product can only be used with an HP approved power cord for your specific geographic region. Use of a non-HP approved power cord may result in: 1) not meeting individual country specific safety requirements; 2) insufficient conductor ampacity that could result in overheating with potential personal injury and/or property damage; and 3) fracturing resulting in the internal contacts being exposed, which potentially could subject the user to a shock hazard. HP disclaims all liability in the event a non-HP approved power cord is used.



AVERTISSEMENT : ce produit ne peut être utilisé qu'avec un cordon d'alimentation approuvé par HP pour votre zone géographique. L'emploi d'un cordon d'alimentation non approuvé par HP peut avoir les conséquences suivantes : 1) non-conformité aux spécifications de sécurité du pays concerné ; 2) intensité admissible du conducteur insuffisante pouvant provoquer une surchauffe créant un risque de blessure ou d'endommagement du produit ; et 3) rupture pouvant exposer les contacts internes et créer un risque d'électrocution pour l'utilisateur. HP décline toute responsabilité en cas d'utilisation d'un cordon d'alimentation non approuvé.



VORSICHT: Dieses Produkt kann ausschließlich mit einem von HP für Ihre Region zugelassenen Netzkabel verwendet werden. Die Verwendung eines nicht von HP zugelassenen Netzkabels kann folgende Konsequenzen haben: 1) Nichteinhaltung der nationalen Sicherheitsbestimmungen, 2) Überschreiten der Strombelastbarkeit des Netzkabels, was zu einer Überhitzung und in der Folge zu Verletzungen und Sachschäden führen kann, 3) Stromschlaggefahr durch Kabelbruch und Freilegen der Adern. Für den Fall, dass ein nicht von HP zugelassenes Netzkabel verwendet wird, übernimmt HP keinerlei Haftung.



AVVERTENZA: Il presente prodotto può essere utilizzato esclusivamente con un cavo di alimentazione approvato da HP specifico per la regione geografica dell'utente. L'utilizzo di un cavo di alimentazione non approvato da HP potrebbe comportare: 1) la non conformità alle normative locali in materia di antinfortunistica; 2) l'insufficienza della capacità di amperaggio del conduttore con conseguente surriscaldamento e potenziali lesioni personali e/o danni alla proprietà; 3) la rottura del prodotto con conseguente esposizione dei contatti interni e potenziali lesioni da scosse. HP rifiuta ogni responsabilità in caso di utilizzo di un cavo di alimentazione non approvato da HP.



警告 : 本製品を使用する場合は、ご使用の地域で定められた HP 認定の電源コードを使用してください。HP が認定していない電源コードを使うと、以下の状態となる可能性があります。1) ご使用の地域の安全な取り扱いに関する規定を満たさない。2) 導電体の電流容量が不十分だと、オーバーヒートし、けがや装置の損傷につながる。3) 破損の結果内部の接続個所がむき出しとなり、ユーザーが感電する危険がある。
HP 非認定電源コード使用時の問題に関して、HP は一切の責任を負いかねます。



WAARSCHUWING: Dit product mag ALLEEN worden gebruikt met een netsnoer dat door HP is goedgekeurd voor gebruik in uw regio. Als u een netsnoer gebruikt dat niet door HP is goedgekeurd, kan dit ertoe leiden dat: 1) u niet voldoet aan de specifieke veiligheidsvoorschriften van uw land, 2) de aderdikte te klein is, waardoor oververhitting kan optreden met lichamelijk letsel en/of beschadiging van de apparatuur tot gevolg, en 3) het netsnoer breekt, waardoor de interne contacten bloot komen te liggen met het risico van letsel door elektrische schok. HP wijst alle aansprakelijkheid af als u een netsnoer gebruikt dat niet door HP is goedgekeurd.



ADVERTENCIA: este producto sólo puede utilizarse con un cable de alimentación aprobado por HP para su región geográfica específica. El uso de un cable de alimentación no aprobado por HP puede provocar lo siguiente: 1) el incumplimiento de requisitos de seguridad específicos del país; 2) insuficiente corriente permanente admisible de conductor que puede provocar un sobrecalentamiento y posibles lesiones personales o daños a la propiedad; y 3) una rotura que deje expuestos los contactos internos, lo que supone un peligro potencial de descarga eléctrica para el usuario. HP renuncia a toda responsabilidad en caso de utilizarse un cable de alimentación no aprobado por HP.



WARNING: Avoid contact with the power supplies, EMI filter, and all other AC electrical components while the cabinet is connected to a power outlet.



AVERTISSEMENT : évitez tout contact avec les blocs d'alimentation, le filtre EMI et tous les autres composants électriques CA pendant que l'armoire est connectée à une prise de courant.



VORSICHT: Wenn der Schrank an das Stromnetz angeschlossen ist, dürfen keinesfalls Netzteile, EMI-Filter oder andere elektrische Komponenten berührt werden.



AVVERTENZA: Evitare il contatto con alimentatori, filtri EMI e qualsiasi altro componente elettrico AC quando il cabinet è collegato a una presa di corrente.



警告： キャビネットが電源コンセントに接続している間は、電源、EMI フィルタ、およびその他すべての AC 電源装置に触らないようにしてください。



WAARSCHUWING: Raak de voedingseenheden, het EMI-filter en de andere elektrische onderdelen niet aan als kast is aangesloten op een stopcontact.



ADVERTENCIA: Evite el contacto con fuentes de alimentación, filtros EMI y otros componentes eléctricos de CA mientras el receptáculo esté conectado a la toma de corriente.

- Use an antistatic wrist strap when touching internal cabinet components. To use the wrist strap properly, place the band around your wrist and attach the clip to the cabinet frame. Keep the strap on until you are ready to close the cabinet doors.
- Keep static-sensitive parts in their shipping containers until ready for installation.

- Do not place static-sensitive parts on any metal surface. If you need to put down a static-sensitive part, place it inside its protective shipping bag or on a grounded antistatic mat.
- Avoid direct contact with static-sensitive parts. Avoid touching connectors and discrete components.
- Close cabinet door and access panel when not working on the cabinet.
- Be very careful when installing the cabinet or handling components in dry climates or environments where cold weather heating is used. Environments such as these with lower relative humidity have greater potential to produce static electricity.

Note: In environments with high potential for static electricity, take additional precautions such as the use of an antistatic smock or a grounded antistatic mat.

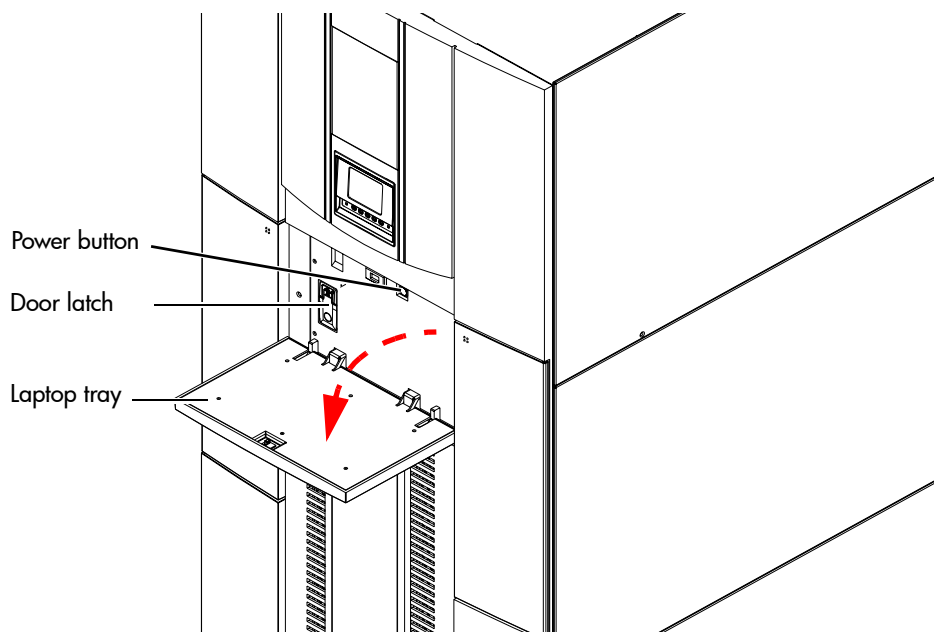
Closing the cabinet doors and access panels

The library has one front door and one back door.

1. Close and lock the front door using the key provided in the accessory kit (see [Figure 27](#)).

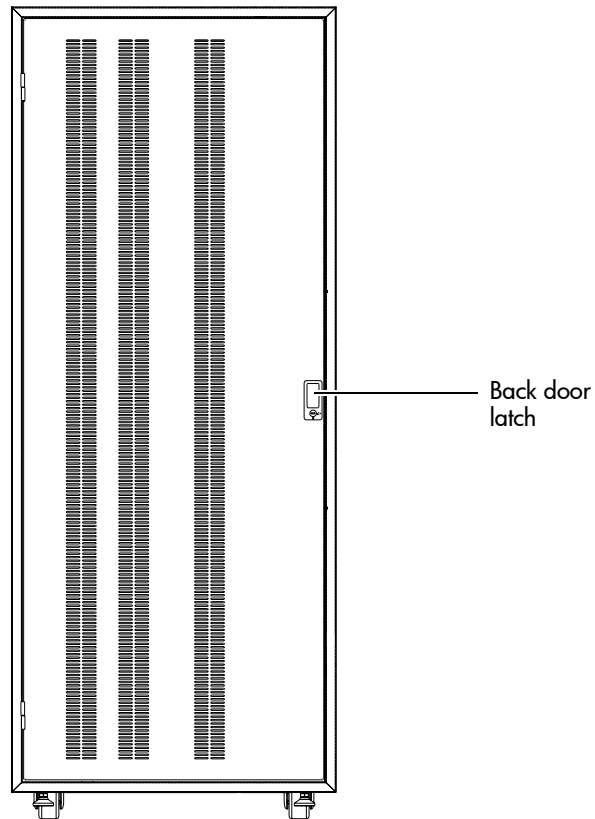
Note: The laptop tray must be lowered to access the front door latch.

Figure 27: Closing the front door



2. Close and lock the back door using the key provided in the accessory kit (see [Figure 28](#)).

Figure 28: Closing the Back Door



Turning the library on and off

This section explains:

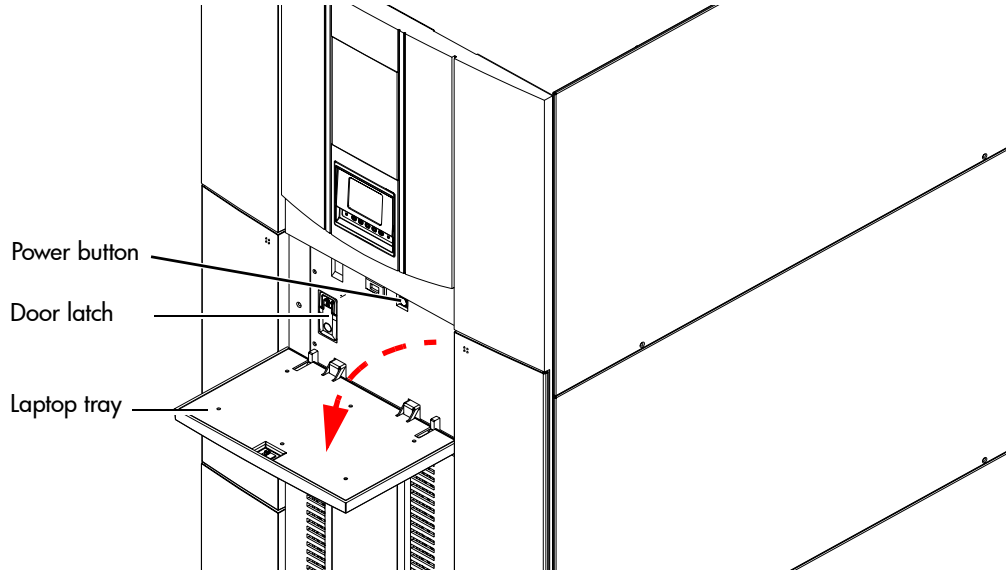
- [Turning on the library](#), page 66
- [Placing the library on-line or off-line](#), page 67
- [Turning off the library](#), page 67

Turning on the library

To turn on the library:

1. Open the back door of the library cabinet and flip the breaker switches on the power distribution unit located on the bottom right side to the on position (right).
2. Verify that power cables are firmly in place.
3. Close all library doors.
4. Turn on the power switch located behind the laptop tray (see [Figure 29](#)).

Figure 29: Turning on the library



Placing the library on-line or off-line

With the library turned on, press the **Ops** button on the OCP to access the **Operations** screen. Select **Cabinet** and use the up and down arrows to turn the library off-line. For more information on the **Operations** screen, see “[Operations screen](#)” on page 78.

Turning off the library

To turn off the library:

1. Place the library off-line, see “[Placing the library on-line or off-line](#)” on page 67.
The library robotics completes any current commands and then stops.
2. Verify that the OCP display indicates “Off-line” from the **Operations** screen.
3. Verify that the media picker is empty.
4. Turn off the power switch located on the front of the library (see [Figure 29](#) on page 66).
5. Open the back door of the library cabinet and flip the breaker switches on the power distribution unit located on the bottom left side to the off position (left).

Note: When powering off the library, ensure that the two breaker switches on the power distribution unit are in the off (left) position.

Using the OCP

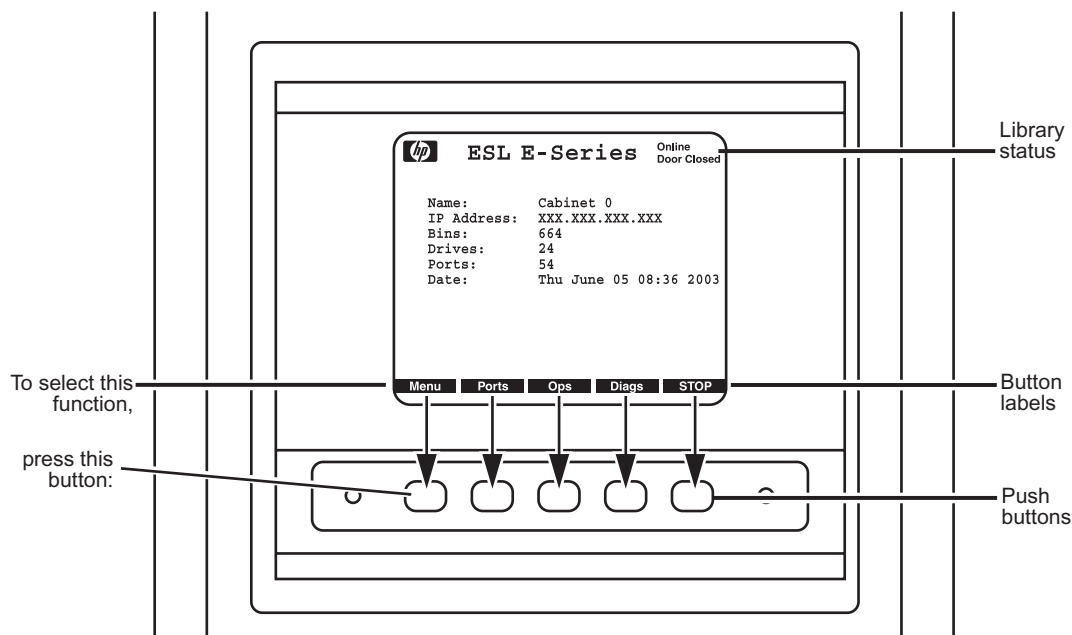
The OCP is located on the front of the library. The menus on the OCP allow you to obtain information about the library, execute library commands, and test library functions. Before using the OCP to perform library functions, familiarize yourself with the:

- [Home screen](#), page 68
- [OCP buttons](#), page 69

Home screen

The first screen the OCP displays after library initialization is the main screen. This screen displays library status and provides information on the IP address, number of bins, tape drives, ports, and the date (see [Figure 30](#)).

Figure 30: Main screen



OCP buttons

At the bottom of each OCP screen are up to five button labels. These labels indicate the functions of the five push buttons below the OCP. To select a function, press the push button directly below the button label on the OCP screen.

OCP components

The OCP allows the user to perform various functions on the library. [Table 8](#) provides a list of the OCP functionality available from the **Home** screen (see [Figure 30](#)).

Table 8: OCP components

Home Screen	Menu Screen	Ports Screen	Ops Screen	Diags Screen
Status display: <ul style="list-style-type: none"> ■ Library Name ■ IP Address ■ Slots ■ Drives ■ Ports ■ Date 	Menu items: <ul style="list-style-type: none"> ■ Library ■ Cabinet ■ Setup 	Load ports: <ul style="list-style-type: none"> ■ Open Left Load Port ■ Open Right Load Port ■ Open Both Load Ports 	Operations: <ul style="list-style-type: none"> ■ Cabinet <ul style="list-style-type: none"> — On-line — Off-line — Inventory — Reboot ■ Drives All <ul style="list-style-type: none"> — Reset — Unthread — On — Off ■ Drives On/Off <ul style="list-style-type: none"> — Details — Reset — Unthread — On — Off 	Diagnostics: <ul style="list-style-type: none"> ■ Robotics Self Test ■ Robotics to Home Position ■ Calibrate Cabinet ■ Sequential Slot Test ■ Sequential Drive Test ■ Random Test ■ Random Slot Test ■ Random Slot to Drive Test

Note: The **Stop** button located in the bottom right-hand portion of the OCP is available from every OCP screen. This button stops the cabinet robot from moving and takes the cabinet offline. To start the robotics and return the cabinet to the online state, press the **Start** button.

The following sections provide information on each function available from the library OCP:

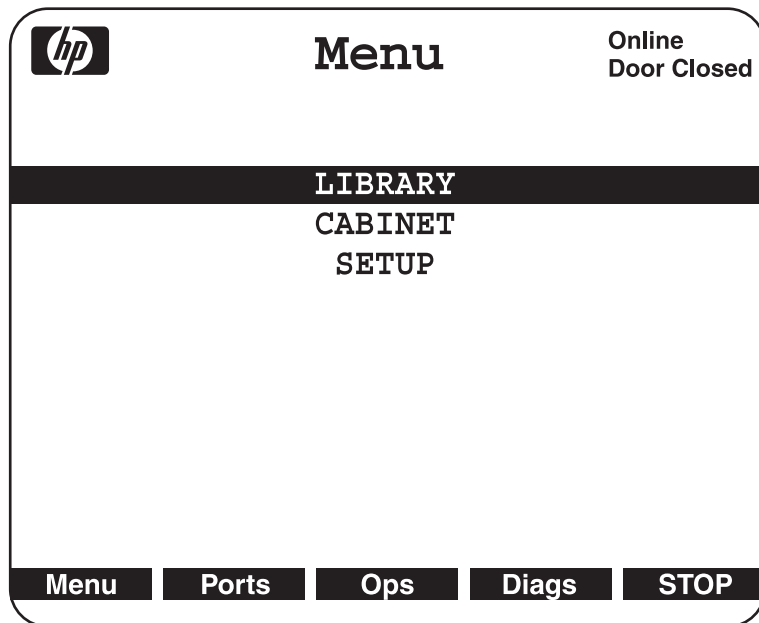
- [Menu screen](#), page 70
- [Load ports screen](#), page 76
- [Operations screen](#), page 78
- [Diagnostics screen](#), page 80
- [Stop button](#), page 82

Menu screen

The **Menu** screen provides access to contact information, cabinet information, as well as providing a way to setup library information.

To access the **Menu** screen, press **Menu** from the **Home** screen. The OCP displays the Menu screen (see [Figure 31](#)):

Figure 31: Menu screen



The **Menu** screen provides the following choices:

- [Library information](#), page 71
- [Cabinet information](#), page 72
- [Setup information](#), page 73

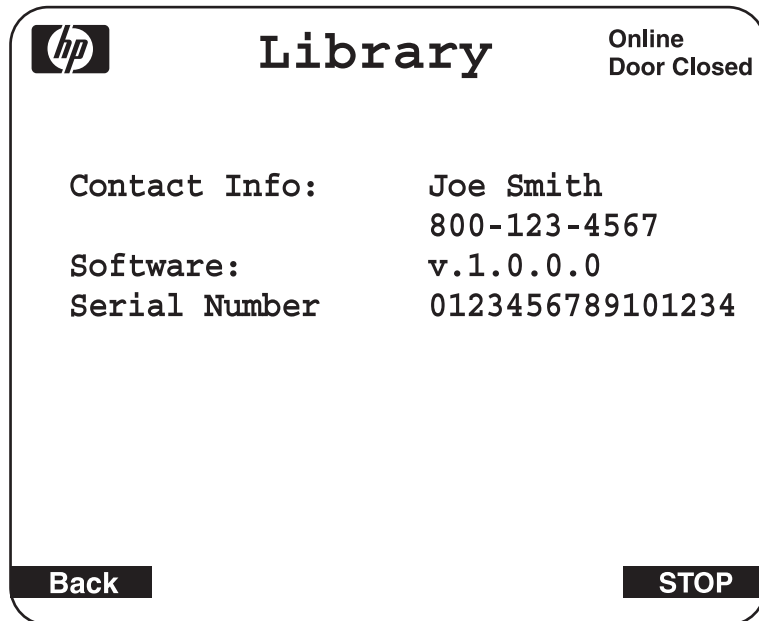
Library information

To view library information:

1. From the **Menu** screen, use the up and down arrows to highlight **Library** and press **Select**.

The **Library** screen displays (see [Figure 32](#)):

Figure 32: Library screen



The **Library** screen displays the following information about the library:

- Contact Info - customer contact information
 - Software - software version currently loaded on the library
 - Serial number - serial number of the library
2. When you are finished viewing library information, press **Back** to return to the **Menu** screen.

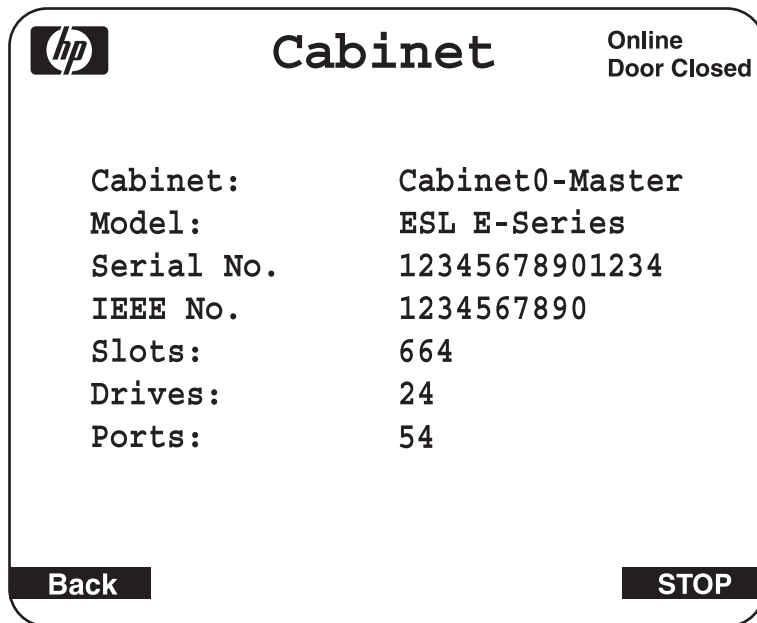
Cabinet information

To view library cabinet information:

1. From the **Menu** screen, use the up and down arrows to highlight **Cabinet** and press **Select**.

The **Cabinet** screen displays (see [Figure 33](#)):

Figure 33: Cabinet screen



The **Cabinet** screen displays the following information about the library cabinet:

- Cabinet - name of the cabinet
 - Model - model number of the cabinet
 - Serial Number - serial number of the cabinet
 - IEEE ID - internal network identification of the cabinet that includes the date of manufacture, product type, and serial number
 - Slots - number of slots configured in the cabinet
 - Drives - number of drives configured in the cabinet
 - Load Ports - number of load port slots configured in the cabinet
2. When you are finished viewing cabinet information, press **Back** to return to the **Menu** screen.

Setup information

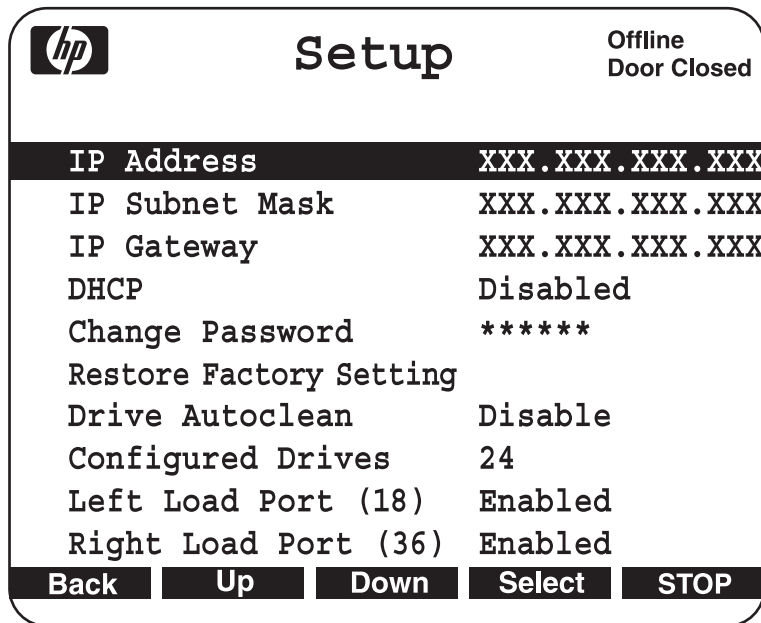
To view or edit the setup information:

1. From the **Menu** screen, use the up and down arrows to highlight **Setup** and press **Select**.
2. The library prompts you for your password. Enter the 6-digit password and wait for validation. The response may not be immediate.

Note: The default password is 001122.

The **Setup** screen displays (see [Figure 34](#)):

Figure 34: Setup screen



The Setup screen displays the following information:

HP Setup		Offline Door Closed		
IP Address	XXX.XXX.XXX.XXX			
IP Subnet Mask	XXX.XXX.XXX.XXX			
IP Gateway	XXX.XXX.XXX.XXX			
DHCP	Disabled			
Change Password	*****			
Restore Factory Setting				
Drive Autoclean	Disable			
Configured Drives	24			
Left Load Port (18)	Enabled			
Right Load Port (36)	Enabled			
Back	Up	Down	Select	STOP

The **Setup** screen displays the following information:

- IP Address
- IP Subnet Mask
- IP Gateway
- DHCP
- Change Password
- Restore Factory Setting
- Drive Autoclean
- Configured Drives
- Left Load Port (16)
- Right Load Port (32)

3. To edit the setup information, use the up and down arrows to highlight the section and press **Select**.
 - To set the IP address, subnet mask, and gateway, use the up and down arrows to select the appropriate number and press **Select** to accept.
 - To enable/disable DHCP, use the up and down arrows to toggle between enable/disable. Press **Select** to accept the setting. If your library is not connected to a network that uses a DHCP server to assign IP information, disable this function.
 - To change the password, use the up and down arrows to select Change Password and press **Select**. To change the password, enter a 6-digit password using the numbers provided on the OCP. Press **Select** to accept the new password. When prompted, re-enter the password to confirm.
 - To enable autoclean, use the up and down arrows to select Autoclean and press **Select**. The default is disabled.
 - To configure the number of tape drives in the cabinet, use the up and down arrows to select the number of drives and press **Select**.



Caution: If you have a partially filled drive cluster, change the number of tape drives to reflect the number of installed drives. For example, a cluster with two drives will show as four drives total with two being inactive. Use the **Setup** menu to change **Configured Drives** to **2** instead of **4**. This will help avoid potential issues with your application software.

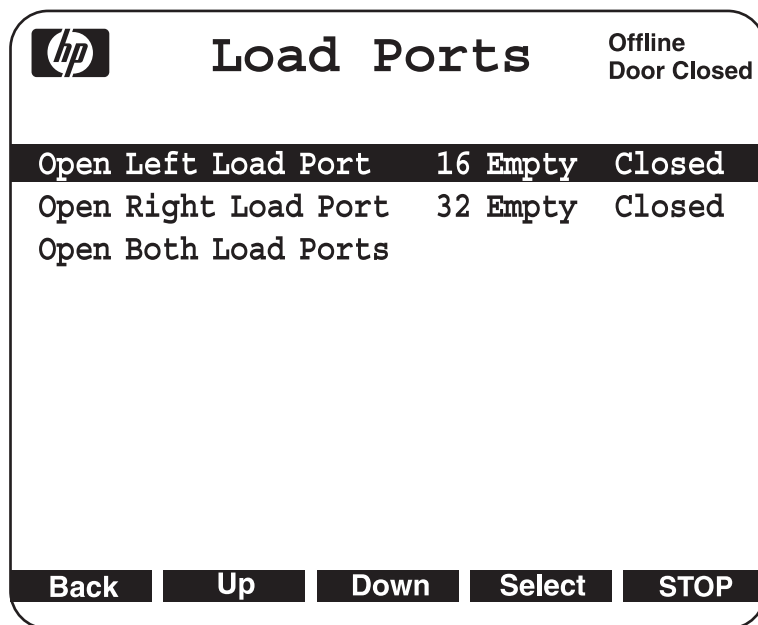
- To enable the left load port, use the up and down arrows to select **Left Load Port (18)** for Ultrium libraries or **Left Load Port (16)** for SDLT libraries, and press **Select**. The default is disabled.
 - To enable the right load port, use the up and down arrows to select **Right Load Port (36)** for Ultrium libraries and **Right Load Port (32)** for SDLT libraries, and press **Select**. The default is disabled.
4. When you are finished viewing/editing the setup information, press **Back** to return to the **Menu** screen.

Load ports screen

The **Load Ports** screen allows the user to lock or unlock a load port.

To access the **Load Ports** screen, press **Ports** from the **Home** screen. The OCP displays the **Load Ports** screen (see [Figure 35](#)).

Figure 35: Load ports screen



1. To open a load port, open the appropriate load port door (left or right).



Caution: When the load port opens, be careful not to damage or remove the foam on the top of the left load port's bin. The library will not operate properly without it.

2. Use the up and down arrows to highlight the specific load port and press **Select**.
3. A warning message appears. Press **OK**. The load port moves forward.
4. Pull the load port towards you to access the storage bins.

5. When you are done, push the load port back into the cabinet until you hear it click into place.
6. Close the load port door. An unload message appears. Selecting **Yes** will move the tape from the load port to the first available slot once a full inventory has been completed. Selecting **No** will return you to the **Load Ports** menu.
7. When you are finished viewing the load port status, press **Back** to return to the **Menu** screen.

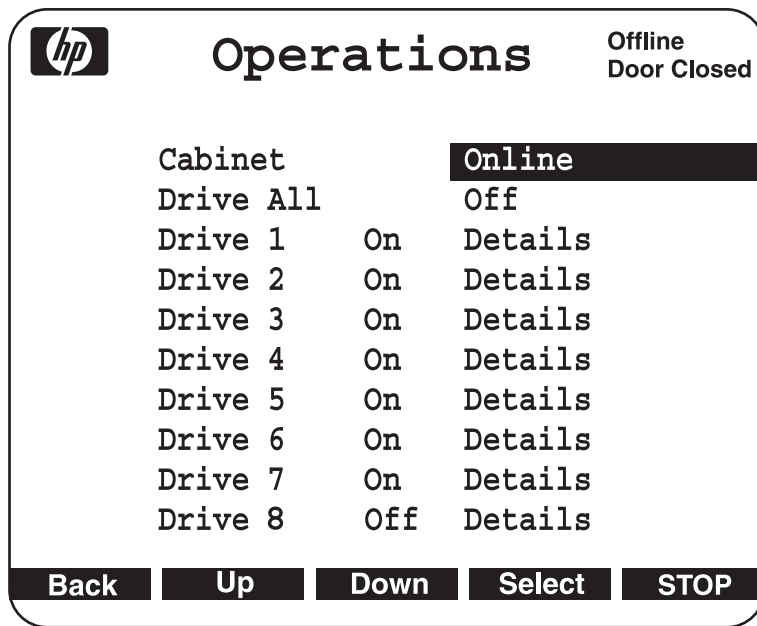
Note: When a load port is opened and closed, an inventory of that load port will be done.

Operations screen

The **Operations** screen allows the user to view the status and issue commands to the cabinet and tape drives.

To access the **Operations** screen, press **Ops** from the **Home** screen. The OCP displays the **Operations** screen (see [Figure 36](#)):

Figure 36: Operations screen



1. To change the status of the cabinet or tape drive(s), use the up and down arrows to highlight the specific device and press **Select**.

The following device options are available:

■ Cabinet:

- Online - library is ready for host communication and backup jobs
- Inventory - library inventories every slot, load port, and tape drive and reports the location of tape cartridges (and bar code labels if available)
- Reboot - library shuts down and reinitializes the system

Note: During a reboot, the cabinet is temporarily unavailable to accept host commands until the cabinet is online.

- Offline - host is no longer able to communicate with the library

Note: Configurations and diagnostics can only be performed when the library is offline.

■ Drive All:

- Off - tape drives are shut down in preparation for tape drive removal
- Reset - tape drives are reinitialized
- Unthread - tapes are unspooled from the drives' internal mechanism in preparation for tape cartridge ejection
- On - tape drives are powered on

■ Drive Commands:

- Details - displays bar code label if present, configuration, inventory, and communications information, lists the drive's World Wide Name, serial number and media type, the status of the last command executed, whether or not cleaning is required, whether power to the drive is on or off, the status of the fan, and the drive's SCSI ID.

Note: The tape drive detail **Status** can have a value of either **0** or **2**. A zero indicates that the last command executed on the drive completed successfully. A two indicates that an error was sent to the host because a command did not complete successfully.

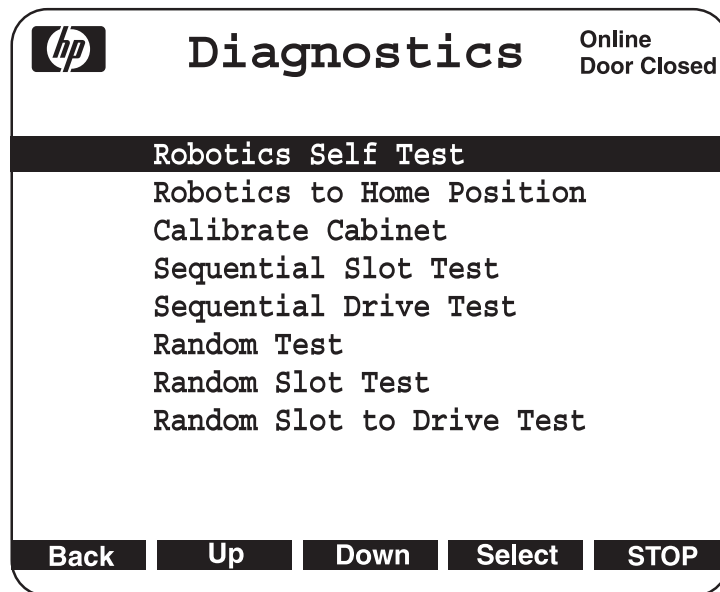
- Reset - tape drive is reinitialized
 - Unthread - tape is unspooled from the drive's internal mechanism in preparation for tape cartridge ejection
 - On - tape drive is powered on
 - Off - tape drive is shut down in preparation for tape drive removal
2. When you are finished viewing the **Operations** screen, press **Back** to return to the **Menu** screen.

Diagnostics screen

The **Diagnostics** screen allows the user perform diagnostic test on the library.

To access the **Diagnostics** screen, press **Diags** from the **Home** screen. The OCP displays the **Diagnostics** screen (see [Figure 37](#)):

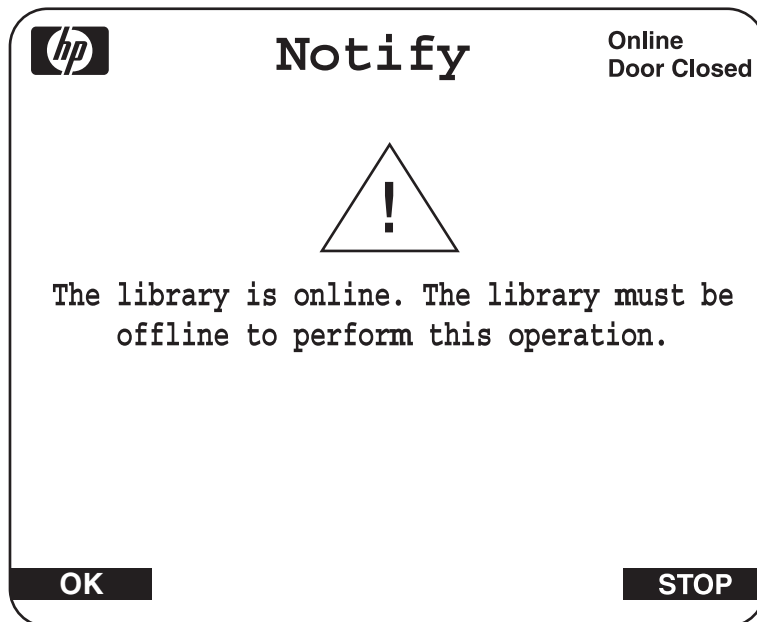
Figure 37: Diagnostics screen



To perform a diagnostic test:

1. Take the library off-line:
 - a. Press the **OPS** button on the OCP to access the **Operations** screen.
 - b. Select **Cabinet**.
 - c. Use the up and down arrows to take the library off-line.
2. Use the up and down arrows to select the diagnostic test to perform and press **Select**.
3. If you did not take the library off-line, the OCP will display a notification (see [Figure 38](#)).

Figure 38: Diagnostics confirmation remaining offline



To take the library offline, press **OK**.

The diagnostic test executes and the OCP displays a status screen indicating the test progress. When the test completes, the test result is shown next to the completed test.

4. When you are finished performing diagnostic tests, press **Back** to return to the **Menu** screen.

Stop button

The **Stop** button located in the bottom right portion of the OCP is available from every OCP screen. This button stops the cabinet robot from moving and takes the cabinet offline. To start the robotics and return the cabinet to the online state, press the **Start** button.

Inserting tape cartridges into the load port

Tape cartridges are inserted into either an 18-cartridge magazine for Ultrium, or a 16-cartridge magazine for SDLT as shown in [Figure 6](#) on page 29.

To insert a tape cartridge into a magazine:

1. Prepare the tape cartridges to be inserted by affixing a bar code label and write-protecting or write-enabling each cartridge as desired.

For more information about these procedures, refer to “[Installing tape cartridges](#)” on page 59.

2. With the load port door open, place the tape cartridges in any available load magazine slot.

The proper orientation for tape cartridge insertion is shown in “[Ultrium 460 tape cartridges](#)” on page 25 and “[SDLT 320 tape cartridges](#)” on page 27.

3. Manually close the load port door by pushing the load port assembly into the cabinet. You will hear a click when it locks into position.

Maintenance and Troubleshooting

3

This chapter describes problems you may encounter during the setup and operation of the library. Corrective information is provided to help you resolve the problems:

- [Start-up problems](#), page 86
- [OCP problems](#), page 87
- [Robotics problems](#), page 88
- [Operating problems](#), page 90
- [Tape drive problems](#), page 91
- [Interface Manager card problems](#), page 92
- [Fibre Channel Interface Controller problems](#), page 96
- [Maintaining tape cartridges](#), page 104
- [Cleaning tape drives](#), page 106

Note: Also see [“Sense Data Values”](#) on page 135 for information on values appearing in library error codes and the error log.

Start-up problems

Table 9 describes corrective actions for problems which occur during start-up.

Table 9: Start-up problems

Problem	Corrective Action
The library does not power on.	Verify that: <ul style="list-style-type: none"> ■ The power cord is connected to a grounded electrical outlet ■ The power distribution unit's two breaker switches are on (left rear corner of cabinet) ■ The power supply switches are on ■ The power switch behind the service tray is on.
The library or tape drives are not detected by the Interface Manager or Command View ESL software.	<ul style="list-style-type: none"> ■ Verify cable connections and termination. ■ Verify the cabling. ■ Verify that the drive is powered on and ready. ■ Ensure that the interface controller is powered on and ready.
During initialization, the library reports "not ready."	<ul style="list-style-type: none"> ■ Determine the failure type by checking any previous error codes returned to the host computer. ■ Correct the cause of the error.
One or more tape drives fail to spin up during start-up.	<ul style="list-style-type: none"> ■ Verify cable connections and termination. ■ Make sure that the drive is not set to powered off on the OCP. ■ Check that the power supplies are switched on for that level (clusters 0 - 5).
The library starts up in standby mode.	Press the Stop button to verify that the library switches to on-line mode. You can use the OCP to select either on-line or standby mode at power on.

OCP problems

Table 10 describes corrective actions for OCP problems.

Table 10: OCP problems

Problem	Corrective Action
The OCP is blank.	<ul style="list-style-type: none">■ Confirm that power is on.■ Use Command View ESL software or the interface manager's command line interface to check for errors on the OCP.
The OCP does not respond to buttons.	<ul style="list-style-type: none">■ Use Command View ESL software or the interface manager's command line interface to check for errors on the OCP.■ Contact an authorized field service engineer.
An error message is displayed.	<ul style="list-style-type: none">■ Write down the details of the error message, including the SK, ASC, and ASCQ numeric values.■ Press Ok to clear the message.

Robotics problems

Table 11 describes corrective actions for robotics problems.

Table 11: Robotics problems

Problem	Corrective Action
The robot does not move at power on.	<ul style="list-style-type: none">■ Make sure that all internal packing materials (foam pads, tie wraps, and shipping restraints) have been removed.■ Check the Stop button; make sure the library is on-line and the Stop button is disabled.
The picker partially grips a tape cartridge.	Issue a Move Cartridge command using your application software to move the cartridge from the picker to an empty storage bin.
The barcode reader fails.	<ul style="list-style-type: none">■ Verify that nothing obstructs the reader.■ Then, restart the library. If the problem continues, contact your service provider.
The robot times out or fails during an operation.	<ul style="list-style-type: none">■ Check that the robot is not obstructed in any way.■ Retry the operation. If it still fails, contact a field service engineer.

Table 11: Robotics problems (Continued)

Problem	Corrective Action
The robot drops a cartridge.	<ul style="list-style-type: none"> ■ Open the doors. Retrieve the cartridge, orient it properly, and place the cartridge in an empty storage bin. (Do not try to place the cartridge in the picker.) ■ Perform an inventory. <hr/> <p>Note: If the operator manually places a cartridge in an empty bin, he must then run an inventory so the library records the position of the manually placed cartridge.</p> <hr/>
A cartridge is in the picker at start-up, when a move command is requested, or after a place command is executed.	If possible, initiate a Move Cartridge command from the picker to a storage slot using your application software.
The picker does not have a cartridge after completing a pick command.	<ul style="list-style-type: none"> ■ Make sure a cartridge can be found in the source location. ■ Perform an inventory. ■ Retry the command. If the pick operation fails again, contact a field service engineer.

Operating problems

[Table 12](#) describes the corrective action for problems that occur during library operation.

Table 12: Problems during library operation

Problem	Corrective Action
The host computer cannot communicate with the library.	<ul style="list-style-type: none">■ Verify that the host computer has been added to the secure manager via the Command View ESL software.■ Verify cable connections and termination.■ Verify that the Fibre Channel port link LEDs show good status.■ Restart the host and the library.■ If the host and library still are not communicating, verify that there is not a zoning issue.
A tape cartridge (medium) is reported not present.	<ul style="list-style-type: none">■ This indicates that the picker could not sense a tape cartridge in a particular storage bin even though the inventory reports that it is present.■ Check to see if the designated cartridge is present. If it is, make sure it is properly seated. (For a tape drive, make sure the cartridge is completely unloaded.) Then retry the command.■ Perform an inventory.■ If the error persists, contact a field service engineer.

Table 12: Problems during library operation (Continued)

Problem	Corrective Action
A move command failed.	<ul style="list-style-type: none"> ■ Check the source and destination. The source should hold the cartridge to be moved; the destination should be empty. ■ Make sure the picker is empty and that there are no obstructions. ■ Also, make sure the library is on-line and the Stop button is released. ■ Retry the command.
A flash memory error is reported.	Contact your service provider.
A maximum temperature exceeded warning is displayed.	<ul style="list-style-type: none"> ■ Turn off the library and allow it to cool down. Lower the room temperature, if possible, and increase ventilation around the library. ■ The air filters may need to be changed. ■ (If the operating temperature is too high, the library will automatically shut down until the temperature drops.)

Tape drive problems

Table 13 describes the corrective action for problems with the tape drives.

Table 13: Tape drive problems

Problem	Corrective Action
The library is unable to communicate with a drive.	<p>This is indicated by a Drive Communication Time-out error.</p> <ul style="list-style-type: none"> ■ Reseat the drive. ■ Verify that the drive is set to on from the OCP.
The tape drive does not eject a cartridge.	<ul style="list-style-type: none"> ■ Attempt the operation from the application software. ■ If unsuccessful, power off the library, disconnect the Fibre Channel cables, power the library back up, and attempt the operation from the OCP

Interface Manager card problems

[Table 14](#) and [Table 15](#) describe the status and network LEDs for the Interface Manager card.

Table 14: Status LED diagnostic codes

Red LED	Green LED	Description
On	Off	BIOS code failed to run.
Blinks 1x per 5 second interval	Off	Hardware POST failed. No firmware images are loaded.
Blinks 2x per 5 second interval	Off	No CompactFlash disk or valid boot sector image found. Make sure to transfer the memory module from the old card to the new card if the interface manager was replaced.
Blinks 3x per 5 second interval	Off	Specified firmware image files were not found. Neither the current nor the previous image was found.
Blinks 4x per 5 second interval	Off	Load or execute command failed (boot code remains at end of process). This indicates that load, decompress, or execution failed on both the current and previous image files.
Off	Blinks 1x per 5 second interval	Normal state. Load or execute command succeeded. Boot code successfully loaded, decompressed, and initiated execution of one of the image files.

Table 15: Network link activity/speed LEDs

LED	Status	Description
Link Activity LED (left side of each Ethernet port)	Off	Port disconnected / no link
	On	Port connected to another Ethernet device
	Flashing	Data is being transmitted / received
Link Speed LED (right side of each Ethernet port)	On	Port is operating at 100 Mbps
	Off	Port is operating at 10 Mbps, or port is not connected (see Link Activity LED)

Table 16 describes common symptoms relating to the Interface Manager card and how to resolve them.

Table 16: Common Interface Manager issues

Symptom	Possible Cause	Solution
Command View ESL server does not detect the Interface Manager card	Bad network connection	<ul style="list-style-type: none"> ■ Verify that the Interface Manager card and the management station are correctly connected to the LAN. ■ Use LEDs to troubleshoot Ethernet cabling. ■ Ping the interface manager to verify network health.
	Interface Manager card not powered on or in ready state	Power on the library. Observe status and link LEDs.
	Incorrect IP address	<p>Verify that the correct IP address of the Interface Manager card is entered in Command View ESL.</p> <ul style="list-style-type: none"> ■ See the <i>HP StorageWorks ESL E-Series Unpacking and Installation Guide</i> for information on obtaining the correct IP address using the OCP. ■ Configure Command View ESL with the correct IP address. See the <i>HP StorageWorks Interface Manager and Command View ESL User Guide</i> for information on adding a library or visit http://www.hp.com/support/cvesl.

Table 16: Common Interface Manager issues (Continued)

Symptom	Possible Cause	Solution
Interface Manager card does not detect one or more FC interface controllers	Bad network connection	<ul style="list-style-type: none"> ■ Verify that the Interface Manager card is properly connected to the FC interface controllers and that the cables are good. ■ Use LEDs to troubleshoot Ethernet cabling. ■ See the <i>HP StorageWorks ESL E-Series Unpacking and Installation Guide</i> for more information.
	Incorrect interface controller	<p>Make sure that the e2400-160 FC interface controller has lettering to the side of the ports. If lettering is above or below the ports, then the wrong controller type was installed. Contact your service provider.</p> <hr/> <p>Note: If you have the wrong controller type, it might still work if the firmware level is at least 5.1.08, the controller is set to DHCP, and its defaults are restored.</p> <hr/>
	Defective Interface Manager card or FC interface controller	Observe status and link LEDs. Replace defective card or controller.
Interface Manager card does not detect drives or library	SCSI cables not connected properly	Check cabling connections.
	SCSI settings or termination not set properly	<ul style="list-style-type: none"> ■ Check the SCSI settings for the device. ■ Check that the SCSI bus is properly terminated and ensure the terminator LEDs indicate a normal state (green).
	Timing issues	Reset the corresponding FC interface controller.
	Drive not powered on or in ready state	Troubleshoot the drive.

Table 16: Common Interface Manager issues (Continued)

Symptom	Possible Cause	Solution
Command View ESL does not run in the browser	Incompatible browser version or Java support not enabled	<ul style="list-style-type: none"> ■ Make sure you are using a minimum of Microsoft Internet Explorer v6.0 SP1 or later, or Netscape Navigator v6.2 or later. ■ Make sure that Java support is enabled in the browser.
	Java Runtime Environment (JRE) not installed	Download and install the Java 2 Platform, Standard Edition v1.4 or later from http://www.sun.com/software/download/technologies.html .
	Bad network connection or network down	<ul style="list-style-type: none"> ■ Check all physical network connections. If the connections are good, contact your network administrator. ■ Ping the management station. If pinging fails and the IP address is correct, contact your network administrator.
	Wrong IP address	Check the IP address of the management station. On the management station, open a command shell and enter <code>ipconfig</code> . You must use this IP address (or the network name of the management station) in the URL to access Command View ESL.
	Management station not running, or Command View ESL service not running on management station.	<ul style="list-style-type: none"> ■ Check to see if the management station is operational. ■ Use the Services applet to verify that the Command View ESL service is running on the management station. Click Start > Settings > Control Panel > Administrative Tools > Services.

Fibre Channel Interface Controller problems

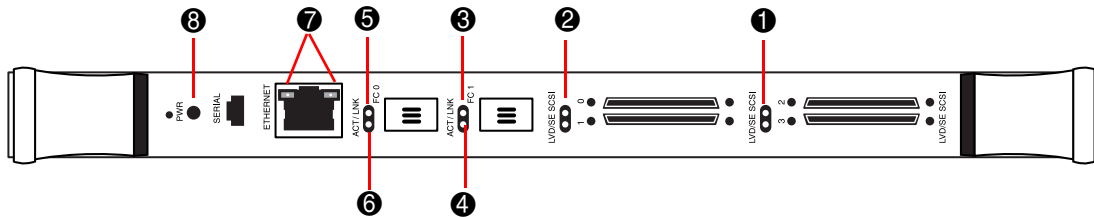
Most problems occur during the initial installation of the FC interface controller. Before proceeding with advanced troubleshooting techniques, verify all connections and review the configuration.

LED Indicators

The LED indicators on the FC interface controller are useful for diagnosing various problems:

- The **SCSI bus LEDs** indicate SCSI activity. These indicators are lit during power on, configuration, and when the unit is transferring data. If the SCSI indicator stays continually lit without any corresponding Fibre Channel LED activity, it may indicate a problem with the SCSI bus configuration. Verify the SCSI bus configuration.
- The **Fibre Channel port LEDs** indicate Fibre Channel activity (ACT) and link (LNK) status. If one of these indicators does not light or stays continually lit without any corresponding SCSI bus activity, it may indicate a problem with a Fibre Channel link. Verify the Fibre Channel port configuration.
- The **Ethernet LEDs** indicate activity and link status. If one of these indicators does not light or stays continuously lit, it may indicate a problem with the network connection. Verify the network connection. The port must be connected to a 10/100BaseT Ethernet network to function properly.

See for [Figure 39](#) for LED locations and functions.

Figure 39: FC interface controller illustration

❶	SCSI bus activity LEDs (on corresponding ports, 0, 1)
❷	SCSI bus activity LEDs (on corresponding ports, 2, 3)
❸	Fibre Channel Link LED on Port 0
❹	Fibre Channel Activity on Port 0
❺	Fibre Channel Link LED on Port 1
❻	Fibre Channel Activity LED on Port 1
❼	Ethernet Activity and Link LEDs
❽	Power LED

Basic Troubleshooting

Simplify the installation by reducing it to the most basic configuration. Then, add elements one at a time, verifying the operation after each step.

Basic troubleshooting includes verifying the setup and the connections, including:

- Verifying SCSI bus configuration
- Verifying Fibre Channel port connection
- Verifying SCSI devices in Windows NT
- Verifying the FC interface controller configuration
- Verifying mapping
- Verifying devices
- Verifying host configuration
- Verifying HBS device driver information
- Verifying serial port configuration
- Verifying PRLI data

Each of these topics is discussed in the following sections.

Verifying SCSI Bus Configuration

Items to check include:

- **Termination** — Problems with termination can cause intermittent or hard failures. A SCSI bus must be terminated on both ends. Termination problems are common when both narrow and wide devices are on the same bus.
- **Bus Type** — On an LVD SCSI bus, SE and LVD devices can be connected to the same bus. However, if one SE device is detected during power on, communication to all devices will convert to SE mode.
- **Device ID** — Each device on a SCSI bus must have a unique ID. Verify configured IDs are not in use by other devices on the same SCSI bus.
- **Cabling** — Check SCSI cables to verify they are functional. SCSI rules for total length, distance between devices, and stub length must be followed. Connections should also be checked and reseated if necessary.
- **SCSI Devices** — Verify that the SCSI devices on a particular SCSI bus can be seen in the Configuration Menu of the FC interface controller. If the FC interface controller cannot see the devices, verify SCSI configuration, cabling, and termination.

Verifying Fibre Channel Port Connection

If SCSI devices are recognized on the SCSI buses, but do not appear to the Fibre Channel host, it may be that the Fibre Channel link is not properly established. Most hubs and switches have link indicators showing link status. When the FC interface controller is connected and powered on, this link indicator should be solid. If it is not, check the cabling or connections.

One method of verifying link integrity when connected to a functional host, involves disconnecting and then reconnecting the Fibre Channel cable. This procedure should cause momentary activity of this indicator as the link reinitializes.

Additionally, verify that the cable type of the FC interface controller and the attached hub, HBA, or switch is of corresponding types. When using optical media, verify that the attached device is using non-OFC type optical devices.

Note: By default, the Fibre Channel port speed is set to 2 Gb/s. Changes to the Fibre Channel port speed must be manually set, such as for 1 Gb/s. If set incorrectly and the FC interface controller is plugged into a Loop or Fabric, the unit may receive framing errors, which can be found in the trace logs, and the fiber link light will be off because of the incorrect Fibre Channel link speed.

Verifying SCSI Devices in Windows NT

When mapping Fibre Channel and SCSI devices, verify the Fibre Channel and SCSI devices are recognized by the FC interface controller.

Windows NT may need to be rebooted with all SCSI devices and the FC interface controller powered on before recognizing the devices.

To verify the Fibre Channel and SCSI devices:

1. Navigate to the Windows NT Control Panel, and select SCSI Adapters.
2. Double-click the Fibre Channel HBA.

The SCSI devices should be listed.

If no devices are listed, verify the FC interface controller configuration, Fibre Channel HBA configuration, and cabling.

If devices are listed, verify the Fibre Channel HBA mapping mode or the AL_PA addresses.

Verifying Windows 2000 Driver

The Windows 2000 driver is the device driver installation file (called an INF file) needed by the MS Windows 2000 Operating System. The FC interface controller needs no driver in reality, as the HBA in the Host PC manages it. But this file lets the Windows 2000 Device Manager register a FC interface controller's Controller LUN as a "System" device, so that the Device Manager thereafter will not consider the controller LUN to be an unknown or "newly discovered" device with every reboot. Using this file, a User only has to "identify the FC interface controller to the Device Manager" once.

To install (register) the FC interface controller with a host Windows 2000 PC that has the FC HBA that will connect to the FC interface controller, use the included INF file (located on the user documentation CD). A controller LUN must also set up on the FC interface controller so that Windows 2000 can "discover" it.

When the FC interface controller FC link is up, the user can either reboot the PC, or run the “Scan for new Hardware” function of the Windows 2000 Device Manager. Either action should cause the HBA to issue a SCSI Inquiry command, to which the FC interface controller replies with its ASCII Inquiry string. Initially, the Windows 2000 Hardware Wizard will use this string to refer to the FC interface controller.

After this discovery interaction occurs, the Hardware Wizard will prompt the user to install a device driver. The user should then select the Wizard's “Search for a suitable driver” option, and specify the folder containing the FC interface controller INF file, in this case located on the user documentation CD.

The Hardware Wizard scans all the INF files in the specified folder, and selects the first INF file it finds with a device entry containing a matching hardware ID string. It then copies the selected INF file, renaming it to “oem<#>.inf”, where the '#' is some integer, and places the copy into the “C:\WINNT\inf” folder. It “compiles” the *INF* file to a “.PNF” file with the same root filename, and uses its FC interface controller model entry information to install -- or register in the FC interface controller's case -- the newly discovered device.

The user must reboot the Host PC to complete the process, as prompted by the Wizard.

Verifying the FC Interface Controller Configuration

If you are in doubt about the configuration or about the location of the error, restore the FC interface controller to the factory default configuration and configure the unit one step at a time, verifying the functionality of the configuration after each change is made.



Caution: Restoring factory defaults overwrites user configurations. Save the configuration via Command View ESL before resetting factory defaults to allow recovery of user configuration.

Verifying Mapping

If the FC interface controller is working in Fibre Channel-to-SCSI Initiator mode and is using Indexed or SCC mapping, try changing to Auto-assigned mapping.

Verifying Devices

HP recommends connecting the SCSI target devices directly to a SCSI interface (for example, a host SCSI bus) to verify that the devices are functional.

Verifying the Host Configuration

In some cases, the Fibre Channel HBA or host device driver may not be working properly. Check the configuration of these elements.

It may be useful to check the release notes for the device driver to see if there are any specific issues or a required configuration. It may also be useful to ensure that the current version of the HBA driver is being used.

Older applications can have expectations about what constitutes a valid SCSI ID, and thus may not correctly handle certain mappings. This is not an issue for the operating system or most applications. However, some applications may exhibit difficulties addressing target IDs greater than 15 (16 and higher.) To resolve this situation, configure the FC interface controller to use hard addressing and set the AL_PA to a value that the HBA will be able to map with an ID less than 16.

Verifying HBA Device Driver Information

Review the HBA device driver *Readme.txt* file for configuration specifics. An HBA may require a different configuration. HBAs typically come with utility programs to view or change their configurations.

Verifying Serial Port Configuration

If you are having problems connecting via the serial interface, verify the configuration of the terminal or terminal emulation program.

Table 17: Terminal Configuration Settings

BAUD Rate	Autobaud, 9600, 19200, 38400, 57600, 115200
Data Bits	8
Stop Bit	1
Parity	None
Flow Control	None or XON/XOFF

If problems persist, verify the cabling.

If a valid Ethernet IP address is configured, serial configuration settings can also be set via Telnet.

Verifying PRLI Data

The FC interface controller returns the PRLI (preliminary login) response data as specified in [Table 18](#).

In the default configuration, the FC interface controller returns PRLI Data (PRLI Accept Payload) with the Target bit SET and the Initiator bit CLEAR. However, some configurations require the Initiator bit be SET, such as in FC interface controller-to-FC interface controller configurations. See the Fibre Channel Overrides Menu for more information about changing the initiator bit.

Table 18: PRLI

Item	Value
PRLI Command Code	0x20
Page Length	0x10
Payload Length	0x10
Type Code	0x8
Type Code Extension	0x0
OPA	0x0
RPA	0x0
IPE	0x1
Response Code	0x1
Originator Process Associator	0x0
Responder Process Associator	0x0
Initiator Function	0x1
Target Function	0x1
Command/Data Mixed Allowed	0x0

Table 18: PRLI (Continued)

Item	Value
Data/Response Mixed Allowed	0x0
Read XFER_RDY Disabled	0x1
Write XFER_RDY Disabled	0x0

Maintaining tape cartridges

Note: In addition to the information provided in this manual, access the *HP StorageWorks SDLT Tape Drive Reference Guide*, and the *HP StorageWorks Ultrium Tape Drive User's Guide* from <http://www.hp.com/support> for more information.

For longer life of recorded or unrecorded tape cartridges:

- Do not carry cartridges loosely in a container that exposes them to unnecessary physical shock. Dropping or bumping cartridges may dislodge and damage internal components.
- Store tape cartridges vertically in their protective cases until needed. Store tape cartridges in a clean environment that duplicates the conditions of the room in which they will be used.
- Use tape cartridges in temperatures between 50°F to 104°F (10°C and 40°C).
- If a tape cartridge has been exposed to extreme heat or cold, stabilize the tape cartridge at room temperature for the same amount of time it was exposed for up to 24 hours.
- Keep cartridges out of direct sunlight and do not place tape cartridges near electromagnetic interference sources, such as terminals, motors, and video or X-ray equipment. Doing so may cause data on the tape cartridge to be altered or erased.
- Do not touch the tape medium or open the tape door unnecessarily. Dust and skin oils can contaminate the tape, impact performance, and cause damage.
- Store tape cartridges in a dust-free environment where the relative humidity is between 20 percent and 80 percent. For longer tape cartridge life, store the tape cartridge at 40 percent to 60 percent relative humidity.
- Use only HP qualified bar code labels. Apply them only in the designated areas of the tape cartridge, and do not apply more than one per cartridge.
- Follow guidelines provided by the tape cartridge manufacturer.

If a tape cartridge is dropped or damage is suspected, gently shake the tape cartridge:

- If it rattles, it is damaged. Restore the data on the tape cartridge if possible and discard the damaged tape cartridge.
- If it doesn't rattle, check the tape leader inside the cartridge. To do this, open the door on the rear of the tape cartridge by releasing the door lock. The tape leader should be visible at the top-left of the tape cartridge.



Caution: Do not touch the tape leader or the tape medium. Dust or skin oils can contaminate the tape, impact performance, and cause damage.

Cleaning tape drives

Use the guidelines in the following sections to clean your tape drives.

Cleaning SDLT tape drives

Be aware of the following:

- Under normal conditions, the cleaning cartridge is effective for about 20 cleanings.
- SDLT tape drives typically do not need regular cleaning, as their design allows for minimal head contamination.
- Use the cleaning tape only if the library indicates that the drive needs cleaning.
- Use the cleaning tape more than once if a tape has severely contaminated the drive heads. If the problem persists after two cleanings, and the cleaning tape has not expired, contact your authorized service provider.

Note: Do not use a DLT, DLT1, or VS cleaning tape (almond in color) in an SDLT drive. SDLT cleaning tapes are gray and use a 7- or 8-character bar code label, CLNxxxS or CLNxxxS1.

To clean the tape heads:

1. Move a cleaning cartridge into the drive using your application software. The tape drive automatically loads the cartridge and cleans the heads.
During the cleaning cycle the drive's green **Ready** LED flashes. At the end of the cleaning cycle, the drive ejects the cartridge.
2. Remove the cleaning cartridge from the drive.

Cleaning Ultrium Tape Drives

Be aware of the following:

- Ultrium tape drives have been developed to have a minimal cleaning requirement.
- An HP Ultrium Universal Cleaning Cartridge can be used up to 50 times. If you are using an older HP Ultrium cleaning cartridge, check the documentation that came with your media.



Caution: Only use HP Ultrium Universal Cleaning Cartridges in Ultrium 460 tape drives.

- If the cleaning cartridge is ejected immediately, then it has expired or is not an Ultrium cleaning cartridge. Discard it and use a new one.

To clean the tape heads:

1. Move a cleaning cartridge into the drive using your application software. The tape drive automatically loads the cartridge and cleans the heads. The cleaning cycle can take up to five minutes.
2. Move the cleaning cartridge back to the proper storage bin using your application software.

Library Specifications



This appendix lists characteristics and specifications of the library. These characteristics and specifications are categorized as follows:

- [Library specifications](#), page 110
- [Performance and reliability characteristics](#), page 111
- [Environmental specifications](#), page 112

Note: Tape drive and media specifications are described in “[Tape drives](#)” on page 24.

Library specifications

[Table 19](#) and [Table 20](#) provide dimensions and other physical characteristics of the library unit.

Table 19: Physical characteristics

Library Dimensions and Weight	
Width	30 in. (76 cm)
Depth	48 in. (122 cm)
Footprint	30 x 48 in. (76 x 122 cm)
Height	75 in. (191 cm)
Weight	Fully loaded library: 1350 lbs. (612 kg) Drives: 13.5 lbs. (6.12 kg) each Cartridges: 7.7 oz. (2.18 kg) each
Tape Drives and Cartridges	
Tape Drives, Max. No.	Up to 24 tape drives
Cartridges, Max. No.	630 SDLT tapes/712 Ultrium tapes

Table 20: Interfaces

Host to Library Interfaces	
Software	SCSI-2 medium changer command set
Power Input	
Power cord	1 or 2 standard US, IEC 320 C19 female connector rated at 125VAC (NEMA 5-20 P connector included)
Host to Tape Drive Interface	
Software	SCSI-2

Note: For HP StorageWorks Fibre Channel Interface Controller specifications, refer to the documentation that shipped with your controller.

Performance and reliability characteristics

Table 21 and Table 22 list performance and reliability characteristics of the library.

Table 21: Performance characteristics

Average Swap Time	18 to 20 seconds, consisting of two Move Medium commands
Inventory	Less than 3 minutes, fully loaded with labeled cartridges

Table 22: Reliability characteristics

MTBF	250,000 power-on hours
MSBF	1 million load/unload cycles
MTTR	Less than 30 minutes

Note: Tape drive and media specifications are described in “Tape drives” on page 24.

Environmental specifications

Table 23 provides various library environmental specifications.

Table 23: Environmental specifications

Power Environment		
Electrical inputs	Voltage	200 VAC to 240 VAC
	Rated Frequency	50/60 Hz
	Rated Current	8A
	Power consumption	VA max 1600W
	Electrical connection to power	IEC 320 C19 male connector inside back door
Climatic Environment		
Temperature (operating)	Dry Bulb	15°C to 32°C (59°F to 90°F)
	Wet bulb	25°C (77°F) maximum
	Thermal transition	11°C per hour
Temperature (shipping and storage)	Dry bulb	-40°C to 66°C (-40°F to 151°F)
	Wet bulb	46°C (115°F) maximum
	Thermal transition	30°C (54°F) per hour
Relative humidity	Operating	20% to 80%, non-condensing
	Shipping and storage	5% to 95%, non-condensing
Altitude	Operating	Sea Level to 10,000 ft. (3,048 m)
	Shipping and storage	Sea Level to 12,000 ft. (3,657 m)
Heat dissipation	Operating	5500 BTU/hr (1400 KCal/hr or 1600 watts)
Direct ESD	Contact discharge	@ 2.0, 4.0, 6.0, 8.0 kV to all external metal panels and doors
	Air discharge	@ 2.0, 4.0, 6.0, 8.0, 10.0, 12.0, 15.0 kV to the front GUI display
Indirect ESD	Contact discharge	@ 2.0, 4.0, 6.0, 8.0 kV to the VCP

Table 23: Environmental specifications (Continued)

Radiated fields per IEC-801-3	Unmodulated	27 MHz to 500 MHz @ 3 V/m
Fast transients (EFT or Burst) per IEC801-4	Data cables Power cables	@ 0.5kV @ 1.0kV
Sound power level	Operating Idle	8.10 Bel 7.83 Bel
Sound pressure @ bystander	Operating	63db

Relocating the Library

B



Caution: HP strongly recommends that an HP authorized service representative relocate a library to another location.

This appendix explains how to relocate the library. As used in this appendix, the term *relocate* means either to ship the library or simply to move it to a nearby location (for example, from one area in a building to another).

The instructions in this appendix are divided into the following sections:

- [Checking the new installation site](#), page 116
- [Preparing the library for relocation](#), page 116
- [Crating the library](#), page 124
- [Preparing the library for operation](#), page 127

To ship the library or move it using a motor vehicle (for example, truck or forklift) follow all of the instructions in this appendix.

To move the library to a new location within the same building or facility, follow all instructions in this appendix except for those found in “[Crating the library](#)” on page 124.

Note: These procedures require the original packing materials of the library. If you do not have the original packing materials, contact your support representative.



Caution: Moving or shipping the library without proper packing materials can result in damage to library components.

Checking the new installation site

Check the new installation site for the library using the guidelines found in the *HP StorageWorks ESL E-Series Pre-Installation Site Survey Instructions*. Make sure the new location meets all applicable clearance, environmental, and power requirements.

Preparing the library for relocation

To prepare the library for relocation:

- [Removing tape cartridges](#), page 116
- [Installing shipping restraints and packing](#), page 117
- [Disconnecting library cables](#), page 123



Caution: Always prepare the library for relocation before any move.

Removing tape cartridges

To remove tape cartridges:

1. Unload all tape cartridges from the tape drives using your application software.
2. Stop all library operation.

Press **Stop** on the OCP. This places the library off-line after the completion of any currently executing operations. Turn the library off.

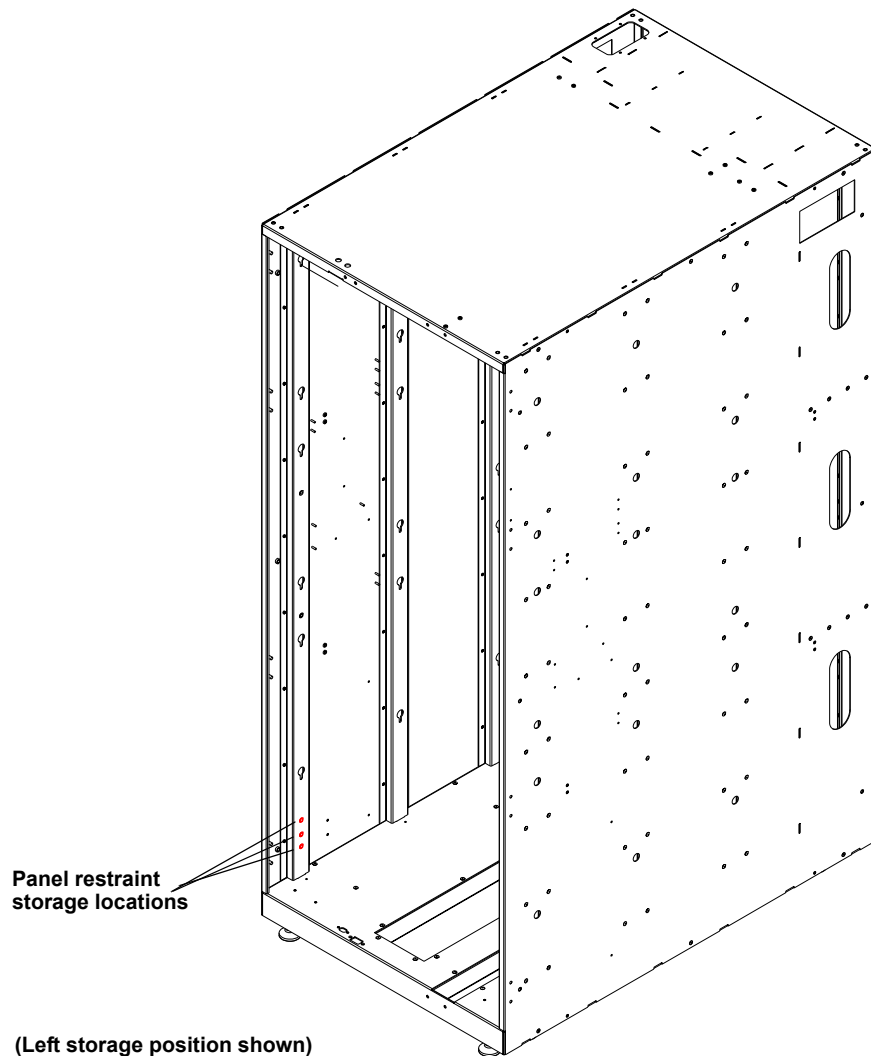
3. Unlock and open both front doors.
4. Remove all tape cartridges from the library bins.
5. Carefully pack all tapes for shipment.

Installing shipping restraints and packing

To install internal shipping restraints:

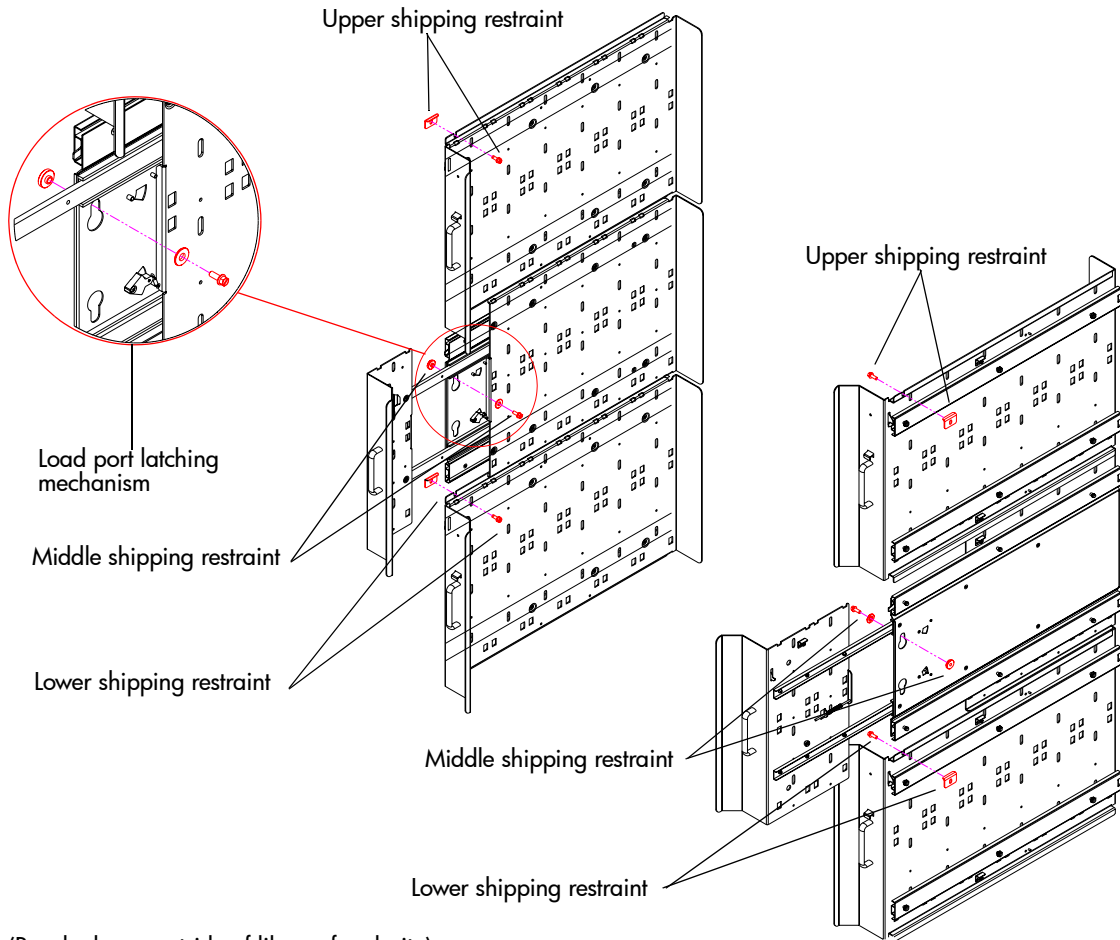
1. Remove the six panel shipping restraints (three sets on each side) from their storage location on the lower cabinet frame (see [Figure 40](#)).

Figure 40: Retrieving the panel shipping restraints



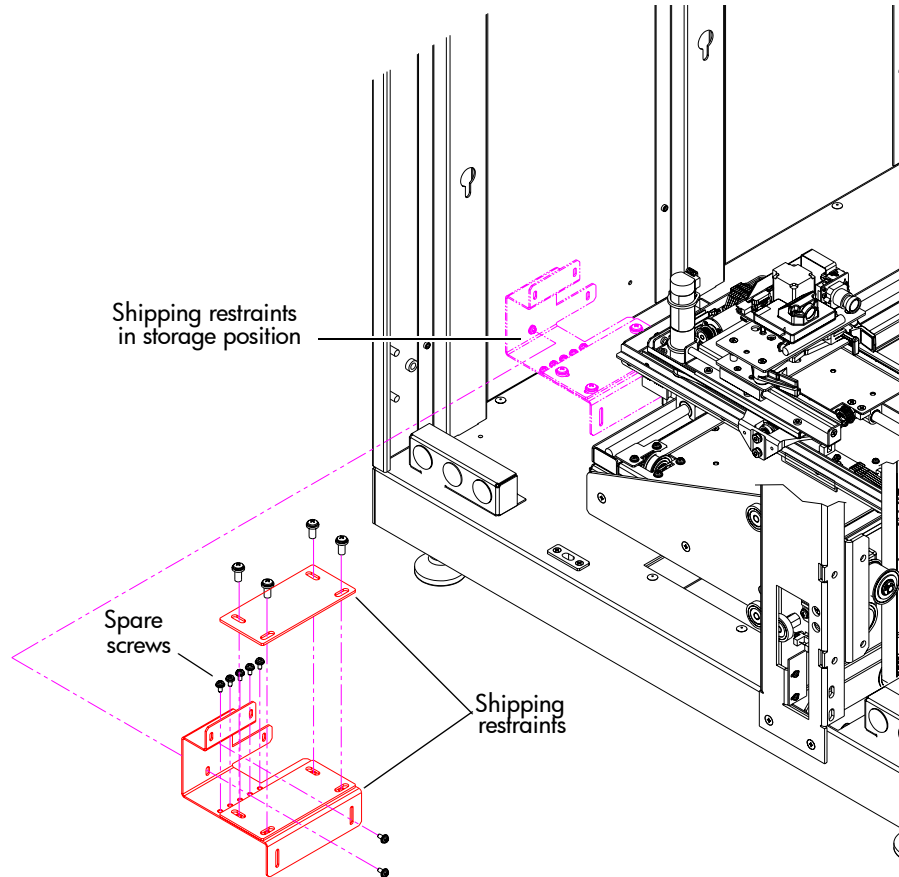
2. Attach the six panel shipping restraints (three on each side) with a 1/4-in nut driver (see [Figure 41](#)).

Figure 41: Attaching the panel shipping restraints



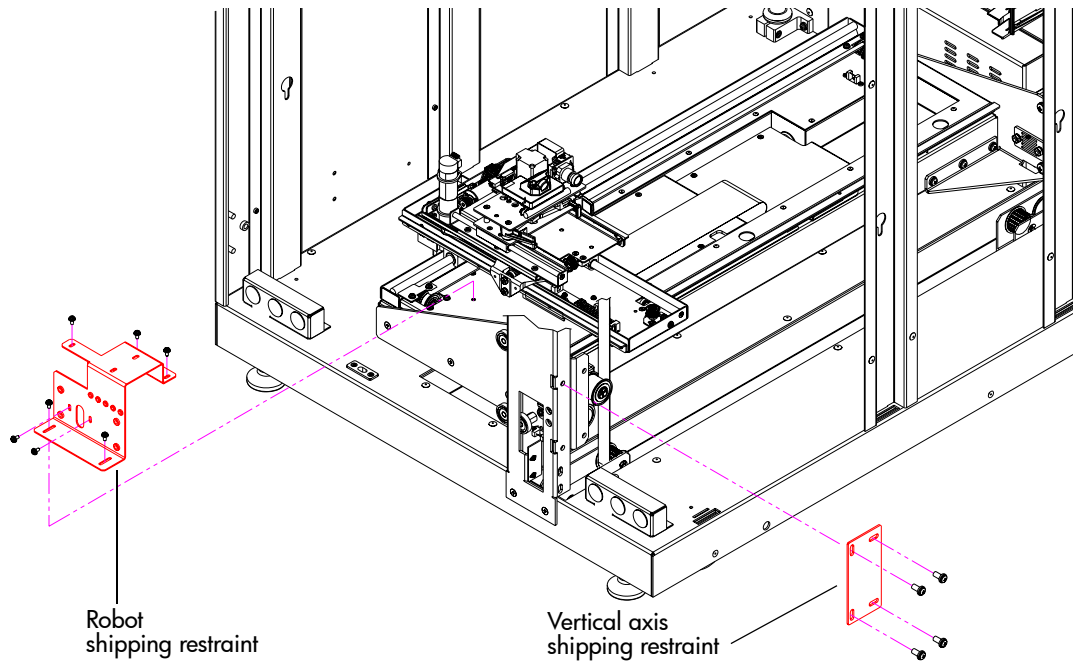
3. Remove the robot shipping restraints from their storage location under the left cartridge bin panel (see [Figure 42](#)).

Figure 42: Shipping restraints - storage location



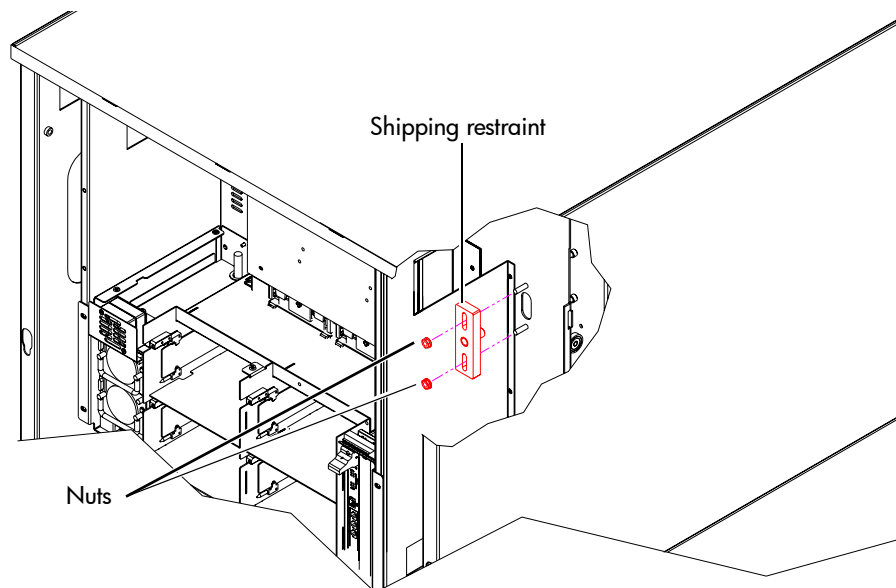
4. If the picker is not in the far right position, gently move it along the horizontal carriage until it is as far front as possible.
5. Install the robotic shipping restraints as shown in [Figure 43](#).

Figure 43: Installing the robotic shipping restraint



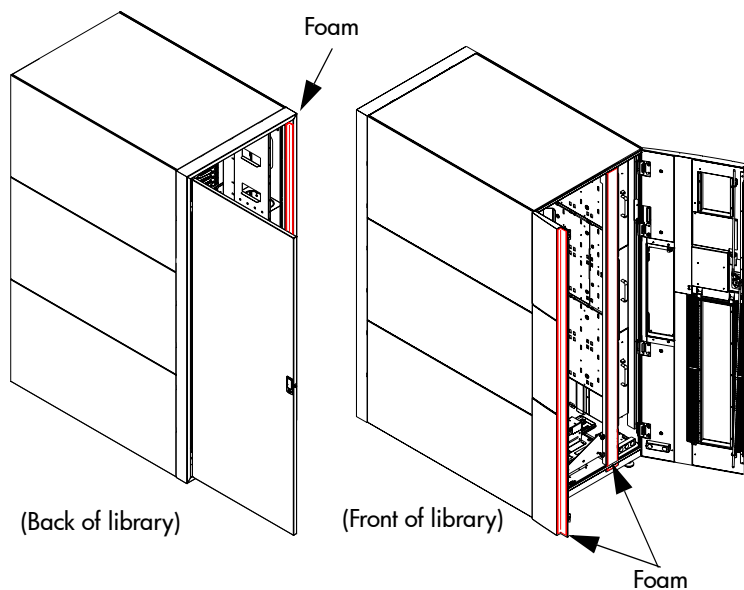
6. Install the counterweight as shown in [Figure 44](#).

Figure 44: Installing the counterweight



7. From the front of the library, add the foam to the Y-axis cover plate, to the left front door, and also to the back door frame (see [Figure 45](#).)

Figure 45: Add the shipping foam



Disconnecting library cables

To disconnect library cables:

1. Disconnect the Fibre Channel cables going from the library to the host.
2. Disconnect the Ethernet cable going to the local network.
3. Disconnect the power cord from the library to its power source
4. Pack the cables removed in [step 1](#) through [step 3](#) with other library accessories.
5. Disconnect the following cables but leave them routed in the channel:
 - Drive cluster and card cage power cables
 - Drive cluster Ethernet cables
 - Drive cluster I2C cables
 - Drive SCSI cables
 - Cabinet controller SCSI cable
 - Robotics controller card (e1200-160) Ethernet cable
 - E2400-160 interface controller Ethernet cables
 - Interface Manager card Ethernet cable

Crating the library

Use this section if you need to:

- Ship the library to the new site.
- Transport the library by forklift or similar means.

If you are moving the library within a facility, refer to “[Preparing the library for operation](#)” on page 127.



WARNING: The library weighs approximately 1350 lb (612 kg). Use at least two people to perform any steps that involve lifting or guiding the library.



AVERTISSEMENT : la bibliothèque pèse environ 612 kg (1 350 livres). Prévoyez la présence d'au moins deux personnes pour effectuer toute opération impliquant de soulever ou de guider la bibliothèque.



VORSICHT: Die Library wiegt ca. 612 kg (1.350 lb). Daher müssen alle Schritte, die das Anheben oder das Führen der Tape Library erfordern, von mindestens zwei Personen durchgeführt werden.



AVVERTENZA: La libreria pesa circa 612 KG. Utilizzare almeno due persone per eseguire qualsiasi operazione di sollevamento o di spostamento della libreria.



警告 : ライブラリの重さは約612Kgあります。ライブラリを持ち上げたり、移動したりする場合は、少なくとも2人以上で作業してください。



WAARSCHUWING: De library weegt ongeveer 612 kg. Als de library moet worden opgetild of voortbewogen, doet u dat dan altijd met twee personen.

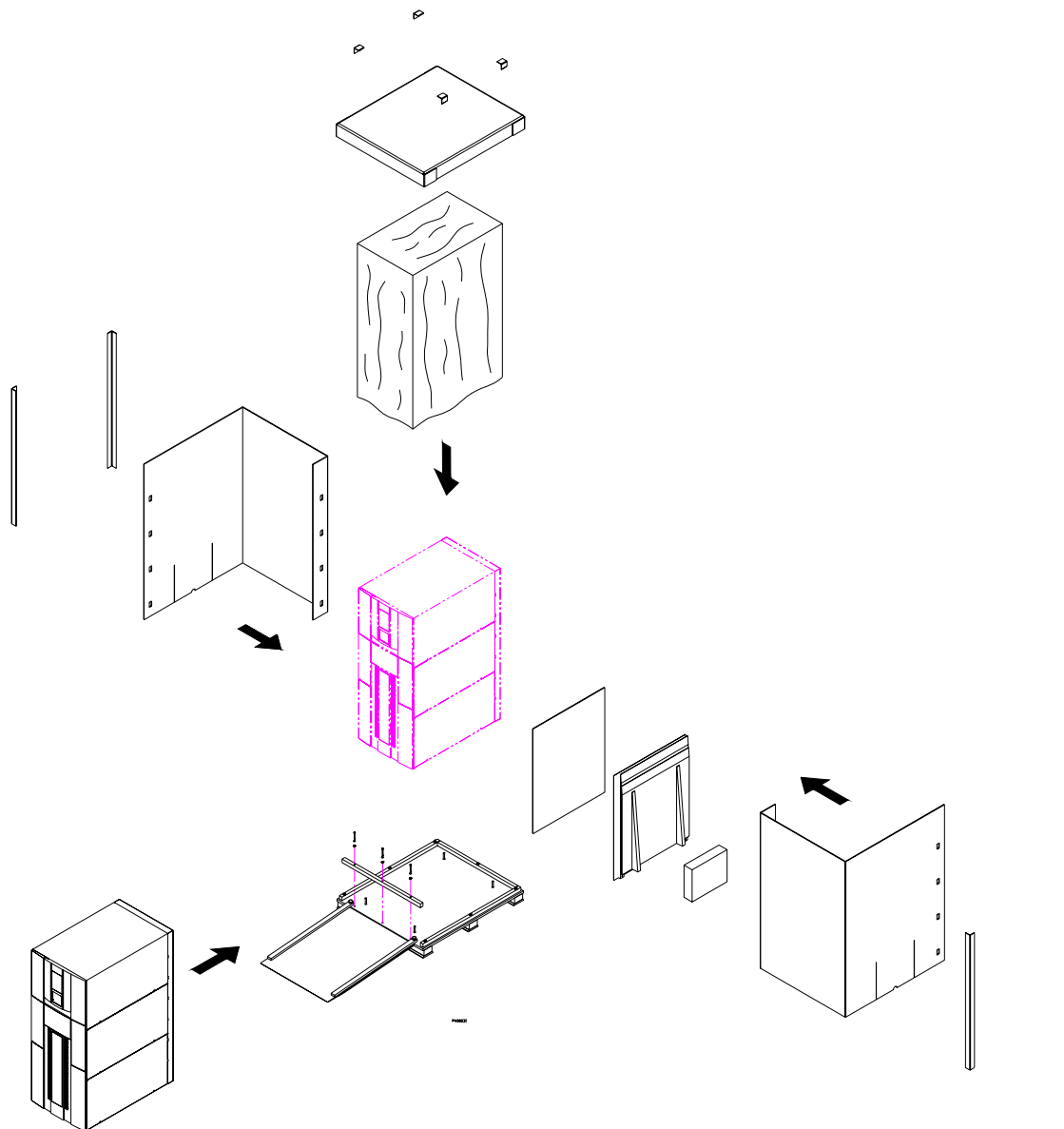


ADVERTENCIA: El peso aproximado de la biblioteca es de 545 kg. Utilice como mínimo dos personas para llevar a cabo cualquiera de los pasos que impliquen la elevación o conducción de la biblioteca.

To crate the library for a new site (see [Figure 46.](#)):

1. Prepare the shipping pallet for the library by attaching the ramp to the pallet.
2. Place the library on the pallet
 - a. Raise the library support feet.
 - b. With the help of at least one person, roll the library to a position in front of the pallet ramp.
 - c. Roll the library onto the pallet.
3. Secure the library.
 - a. Place the shipping bag over the library, and secure it into place.
 - b. Use the four shipping bolts to secure the library to the pallet.
 - c. Remove the ramp from the pallet and lean it against the side of the library with a cardboard sheet between the library and the ramp.
4. Place the accessory kits onto the pallet.
5. Place the foam cap over the library.
6. Wrap the cardboard crate around the library and fasten it using the plastic restraining clips.
7. Place the top onto the crate.
8. Secure the crate with two steel restraining bands.

Figure 46: Crating the library



Preparing the library for operation

After shipping or moving the library, refer to the *HP StorageWorks ESL E-Series Pre-Installation Site Survey Instructions* and the *HP StorageWorks ESL E-Series Unpacking and Installation Guide* to:

- Prepare the new installation site
- Receive the library
- Uncrate the library
- Position the library
- Install and configure the library

Note: The ESL E-Series library must be unpackaged and installed by authorized HP service personnel only.

Regulatory Statements



FCC statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Any changes or modifications made to this equipment may void the user's authority to operate this equipment.

Operation of this equipment in a residential area may cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Herstellerbescheinigung

Diese Information steht im Zusammenhang mit den Anforderungen der Maschinenlärn information sverordnung vom 18 Januar 1991.

Schalldruckpegel $L_p < 70 \text{ dB(A)}$

am arbeitsplatz

normaler betrieb

nach ISO 7779: 1988/EN 27779:1991 (Typprüfung)

BSMI statement

警告使用者:

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

Japan statement (VCCI)

この装置は、情報処理装置等電波障害自主規制協議会 (VCCI) の基準に基づくクラスA 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

Industry Canada (digital apparatus)

Reference: *Interference-Causing Equipment Standard*, ICES-003 Issue 2

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

CISPR-22 WARNING!

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

ACHTUNG!

Dieses ist ein Gerät der Funkstörgrenzwertklasse A. In Wohnbereichen können bei Betrieb dieses Gerätes Rundfunkstörungen auftreten, in welchen Fällen der Benutzer für entsprechende Gegenmassnahmen verantwortlich ist.

ATTENTION!

Ceci est un produit de classe A. Dans un environnement domestique, ce produit peut causer des interférences radioélectriques. Il appartient alors à l'utilisateur de prendre les mesures appropriées.

Notice for USA and CANADA only

If shipped to USA, use the UL LISTED power cord specified below for 200-240 V operation. If shipped to Canada, use the CSA CERTIFIED power cord specified below for 200-240 V operation.

- Plug Cap: NEMA twist-lock plug with ground pin (NEMA L6-20P configuration)
- Cord Type: SJT, three 12 AWG (3 x 2.50 mm²) or 18 AWG (1.0 mm²) wires
- Length Maximum: 15 feet (4.5m)
- Rating Minimum: 25 A, 125 V

ATTENTION

LIRE LA REMARQUE DANS LE MODE D'EMPLOI.

REMARQUE

CETTE REMARQUE NE CONCERNE QUE LES ÉTATS-UNIS ET LE CANADA.

En cas d'envoi aux États-Unis, utiliser le cordon d'alimentation CERTIFIÉ UL et convenant pour 200-240 V.

En cas d'envoi au Canada, utiliser le cordon d'alimentation CERTIFIÉ CSA et convenant pour 200-240 V.

- Fiche: Broches parallèles avec une broche de mise à la terre (configuration NEMA L6-20P)
- CordonType: SJT, trifilaire 12 AWG (3 x 2.50 mm²) ou 18 AWG (1.0 mm²)
- Longueur Maximum: 15 pieds (4.5m)
- Capacité Minimum: 25A, 125 V

Laser statement

Class 1 laser product



Caution: With all panels and enclosures in place, this product is rated as a Class I laser product. The bar code scanner inside this product, however, is a Class II laser. Avoid exposure to the laser light emitted from the bar code scanner. Do not stare into the beam.



Caution: Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous exposure.

Laser klasse 1

VORSICHT: Dieses Produkt Enthält Einen Laser der Kategorie II. Laserstrahlen - Der Strichcode-scanner Gibt Laserstrahlen aus. VERMEIDEN SIE jeden Blickkontakt und direkten körperlichen Kontakt mit diesen Strahlen.

VORSICHT: Ein nicht ordnungsgemäßer (siehe hier enthaltene Anweisungen) Einsatz bzw. Änderungen der Betriebsleistung können einen Gesundheit gefährdenden Kontakt zur Folge haben.

Appareil à laser de classe 1

ATTENTION: Ce produit émet de la classe laser II. Rayonnement laser - NE PAS fixer des yeux le rayon. Éviter les expositions - Le rayonnement laser est émis à partir du lecteur optique de code barre.

ATTENTION: L'utilisation de contrôles ou d'ajustements de performance des procédures autres que ceux indiqués ici peut entraîner une exposition dangereuse.

Producto láser de clase 1

¡ATENCIÓN! Este producto contiene laser de clase II. Luz de laser - NO mire el rayo. Evite el contacto con la luz: la luz de laser se emite desde el explorador de código de barras.

¡ATENCIÓN! El uso de los controles o ajustes para realizar procedimientos que no son especificados puede provocar una situación peligrosa.

Luokan 1 laserlaite

ATTENZIONE: Questo prodotto emette una luce laser di Classe II. NON guardare il fascio di luce ed evitare di esporsi alla fonte del laser. Il fascio di luce laser h emesso dal dispositivo di scansione del codice a barre.

ATTENZIONE: L'uso di comandi o regolazioni per eseguire le procedure che non siano quelli specificati in questa documentazione pur causare rischi all 'incolumit' delle persone.

Battery statement



Caution: This product contains a Lithium battery. The Dallas Semiconductor DS12B887 on the motherboard contains a Lithium battery. Lithium may be considered a hazardous material. Dispose of this battery in accordance with local, state, and federal laws.

LET OP

Dit product bevat een lithiumbatterij. De DS12B887-chip van Dallas Semiconductor op het moederbord bevat een lithiumbatterij. Lithium kan als gevaarlijk materiaal worden beschouwd. Werp de batterij weg in overeenstemming met de plaatselijke en landelijke milieuwetgeving.

VAROITUS

Tässä tuotteessa on litiumparisto. Emolevyllä oleva Dallas Semiconductor DS12B887 sisältää litiumpariston. Litium saattaa olla luokiteltu vaaralliseksi aineeksi. Hävitä tämä paristo paikallisten lakien ja määräysten mukaisesti.

ATTENTION

Ce produit contient une batterie au lithium. Le composant Dallas DS12B887 de la carte mère contient une batterie au lithium. Le lithium peut être considéré comme un produit dangereux. Rejetez cette batterie selon les règlements locaux, régionaux ou fédéraux.

ACHTUNG

Dieses Produkt enthält eine Lithium-Batterie. Der Dallas Halbleiter DS12B887 auf der Hauptplatine enthält eine Lithium-Batterie. Lithium gilt als speziell zu entsorgender Sondermüll. Bei der Entsorgung dieser Batterie müssen die entsprechenden lokalen, länder- und bundesweiten Gesetze und Regelungen betreffend Sammel- und Rückgabestellen beachtet werden.

Attenzione

Questo prodotto contiene una batteria al litio. Il modulo Dallas Semiconductor DS12B887 contiene una batteria al litio sulla scheda madre. Il litio può essere considerato un materiale pericoloso. Utilizzare questo tipo di batterie in accordo con le normative vigenti.

PRECAUCIÓN

Este producto contiene una batería de litio. El modelo Dallas Semiconductor DS12B887 de la placa base contiene una batería de litio. El litio puede ser considerado un material peligroso. Deseche la batería conforme a la normativa vigente de aplicación.

VARNING!

Denna produkt innehåller ett litiumbatteri. Dallas Semiconductor DS12B887 på moderkortet innehåller ett litiumbatteri. Litium kan betraktas som ett miljöfarligt ämne. När batteriet förbrukats, ska de lagar som gäller för miljöfarligt avfall respekteras.

Sense Data Values



This appendix lists sense data values and descriptions. These values appear in library error codes, as well as in the library error log.

[Table 24](#) lists message information that can be sent from the tape library to the host computer. The table is sorted by the data in the ASC column (second column from left) and lists the following information:

- Sense Key
- Additional Sense Code (ASC)
- Additional Sense Code Qualifier (ASCQ)
- Message name, description and (potential) recovery action
- Valid Interfaces
 - SCSI (host computer)
 - DIAG (diagnostic port/computer)
 - Both = SCSI and DIAG port

[Table 25](#) lists message information for hardware failures ASCQ values. The table is sorted by the data in the ASCQ column and lists the following information:

- ASCQ
- Message name, description and (potential) recovery action

Message name and description may contain abbreviations as follows:

- LU = Logical Unit
- REQ'D = Required
- DEV = Device
- DIAG = Diagnostics
- NVRAM = Nonvolatile RAM
- A/D = Analog-to-Digital

Table 24: Sense data values (Hexadecimal)

Sense Key	ASC	ASCQ	Message Name/Description
0	00	00	NO ADDITIONAL SENSE INFORMATION No recovery necessary.
2	04	00	LU IS NOT READY, CAUSE NOT REPORTABLE Internal error. Retry command.
2	04	01	LOGICAL UNIT IN PROCESS OF BECOMING READY Wait for library unit to complete initialization.
2	04	02	LOGICAL UNIT INIT REQUIRED Element status or calibration unknown. Perform “Initialize Element Status” command (SCSI) or “Initialize Inventory” command (DIAG).
2	04	03	LU IS NOT READY, MANUAL INTERVENTION REQ'D Initialization failed. Determine failure type by checking any previous error code returned to host. Reinitialize element status through backup package or command line interface.
5	04	07	DRIVE FW UPDATE IN PROGRESS The drive can not perform indicated request because it is in the process of updating it's firmware.
B	08	00	LOGICAL UNIT COMMUNICATION FAILURE Check cables. Ensure library unit is turned on. Retry command.
B	08	01	LIBRARY COMMUNICATION TIME-OUT Internal communications not responding. Retry command.
5	1A	00	PARAMETER LIST LENGTH ERROR Invalid parameter list length field specified by command.
5	20	00	INVALID COMMAND OPERATION CODE Verify the host command format.

Table 24: Sense data values (Hexadecimal) (Continued)

Sense Key	ASC	ASCQ	Message Name/Description
5	21	01	INVALID ELEMENT ADDRESS Check Mode Sense data for correct element addresses.
5	24	00	INVALID FIELD IN COMMAND DATA BLOCK Ensure all reserve fields are set to zero.
5	25	00	LOGICAL UNIT IS NOT SUPPORTED Verify the logical unit field specified in the command contains a legitimate logical unit number. Check cabling to logical unit.
5	26	00	INVALID FIELD IN PARAMETER LIST Verify Mode Select page fields. Verify that fields comply with command format described in this guide.
5	26	02	PARAMETER VALUE INVALID Verify Mode Select page fields. Verify that fields comply with command format described in this guide. This response is also returned for commands issued to the diagnostic interface of the library if an invalid parameter is sent.
6	28	01	IMPORT OR EXPORT ELEMENT ACCESSED Load port door has been closed.
6	29	00	POWER-ON, RESET OR BUS DEVICE RESET OCCURRED Informational message. If power on occurs, the host user should assume the inventory may have changed, and should ask the library for that information again.
6	29	01	POWER-ON RESET OCCURRED. Informational message. If power on occurs, the host user should assume the inventory may have changed, and should ask the library for that information again.

Table 24: Sense data values (Hexadecimal) (Continued)

Sense Key	ASC	ASCQ	Message Name/Description
6	29	02	BUS RESET OCCURRED. Informational message. If power on occurs, the host user should assume the inventory may have changed, and should ask the library for that information again.
6	29	03	BUS DEVICE RESET OCCURRED Informational message. If power on occurs, the host user should assume the inventory may have changed, and should ask the library for that information again.
6	29	04	INTERNAL DEVICE RESET OCCURRED Informational message. If power on occurs, the host user should assume the inventory may have changed, and should ask the library for that information again.
6	2A	01	MODE PARAMETERS CHANGED Mode parameters may have changed due to another host issuing a Mode Select command.
B	30	00	INCOMPATIBLE MEDIA An attempt was made to move media to a destination element that is incapable of receiving it.
-none-	30	03	CLEANING CARTRIDGE INSTALLED Indicates that the element contains a cleaning cartridge that is not "used-up." This is returned with the element status data, which has no sense key.
5	30	03	CLEANING CARTRIDGE INSTALLED A cleaning cartridge cannot be removed from a drive because it is being used in a cleaning operation. A cartridge cannot be placed into the drive because the drive is being cleaned. A cartridge cannot be placed into an empty storage element because it is reserved for a cleaning cartridge that is currently in use in a drive cleaning operation.

Table 24: Sense data values (Hexadecimal) (Continued)

Sense Key	ASC	ASCQ	Message Name/Description
5	39	00	SAVING PARAMETERS NOT SUPPORTED Verify Save Parameter field in the Mode Select page complies with the command format described in this guide.
5	3A	00	MEDIUM NOT PRESENT The inventory indicated that a cartridge was in this bin but no cartridge was sensed by the picker when it attempted to pick it. Retry the command. Check for proper seating of the cartridge. It may also indicate that the tape is not ready to be picked from the drive because the tape is not fully unloaded. Retry the command.
5	3B	0D	MEDIUM DESTINATION ELEMENT FULL Destination element address already contains a cartridge. Issue a Read Element Status command and retry move command using your application software. If the problem recurs, issue an Initialize Element Status command followed by a Read Element Status command and retry move command using your application software.
5	3B	0E	MEDIUM SOURCE ELEMENT EMPTY Source element address does not contain a cartridge. Issue a Read Element Status command and retry move command using your application software. If the problem recurs, issue an Initialize Element Status command followed by a Read Element Status command and retry the move command using your application software.
B	43	00	SCSI MESSAGE ERROR Detected message error in message processing on the SCSI BUS.
B	47	00	SCSI PARITY ERROR SCSI Parity Error detected. Check cable connections and cable length.

Table 24: Sense data values (Hexadecimal) (Continued)

Sense Key	ASC	ASCQ	Message Name/Description
5	4E	00	OVERLAPPED COMMANDS ATTEMPTED Due to a second command being sent from the same host before a previous command has completed, the previous command has been aborted. This may also occur when executing off-line commands via the control panel and DIAG port simultaneously.
3	52	00	DRIVE REPORTING MEDIA ERROR The tape drive is indicating that it has detected a problem with the media. See the tape drive user's manual for more information
5	53	02	MEDIUM REMOVAL PREVENTED Prevent Medium Removal command was executed and command was received to export cartridge. Execute Allow Medium Removal command and retry move medium command using your application software.
2	5A	01	OPERATOR MEDIUM REMOVAL REQUEST Indicates that the element contains a cleaning cartridge that is "used-up" and the system is unable to export the cleaning cartridge. Manually unload the tape. The load port door is open, so import/export elements can not be accessed.
2	80	00	DOOR IS OPENED INVENTORY MAY HAVE BEEN CORRUPTED Close door and retry command. If the system is ON-LINE, it executes its initialization procedure.
6	80	00	DOOR WAS OPENED INVENTORY MAY HAVE BEEN CORRUPTED Close door and retry command.

Table 24: Sense data values (Hexadecimal) (Continued)

Sense Key	ASC	ASCQ	Message Name/Description
-none-	80	01	<p>DRIVE REQUIRES CLEANING</p> <p>Tape drive indicates that drive needs cleaning. Clean the tape drive. This is returned with element status data, which has no sense key.</p>
5	80	01	<p>TRANSFER FULL - COMMAND CAN NOT BE EXECUTED</p> <p>Picker has cartridge in it. Move cartridge to empty storage element using Move Medium command via your application software. Retry command.</p>
B	80	01	<p>TRANSFER FULL - AT END OF PLACE</p> <p>Picker has cartridge in it at end of a place operation (Move Medium with a target other than the Transfer). Move cartridge to empty storage element using Move Medium command via your application software. Retry command.</p>
B	80	06	<p>TRANSFER EMPTY - COMMAND ABORTED</p> <p>Picker does not contain cartridge at end of pick portion of Move Medium command.</p>
2	80	07	<p>SYSTEM IS STOPPED</p> <p>The STOP button on the control panel was pressed. Press the STOP button.</p>
6	80	07	<p>SYSTEM STOP BUTTON WAS PRESSED</p> <p>The STOP button on the control panel was pressed. Press the STOP button. Retry command.</p>
6	80	08	<p>LOGICAL UNIT TURNED ON-LINE</p> <p>Through the menu options, bring the library on-line.</p>
2	80	09	<p>LOGICAL UNIT IS TURNED OFF-LINE</p> <p>Through the menu options, bring the library on-line.</p>

Table 24: Sense data values (Hexadecimal) (Continued)

Sense Key	ASC	ASCQ	Message Name/Description
6	80	09	LOGICAL UNIT TAKEN OFFLINE Library was taken off-line through the remote web management or GUI.
B	80	10	LOAD RETRY FAILED Library was unable to successfully load and thread the drive, even after retries. Check drive alignment. If the problem continues, drive may need servicing.
4	80	0A	CONFIGURATION SETTINGS CORRUPTED Reconfigure the library. If problem persists, call Technical Support.
B	80	0B	COMMAND ABORTED BY USER Informational message. No action is necessary.
B	80	0D	CARTRIDGE PARTIALLY GRIPPED Issue a Move Medium command using your application software to move the cartridge from the transfer element to an empty storage element.
6	80	0E	DATA TRANSFER CHANGED A drive has been inserted/removed into the system. Use "Read Element Status" to determine status of drives.
4	80	0F	LOW POWER ERROR Check power connections.
4	80	11	MOTOR POWER FAILURE Indicates motor power turned off for a reason not otherwise reported.
5	80	22	ELEMENT CONTENTS UNKNOWN The contents of an element address are unknown. Issue a Read Element Status for the element address. If contents are still unknown issue an Initialize Element Status command.

Table 24: Sense data values (Hexadecimal) (Continued)

Sense Key	ASC	ASCQ	Message Name/Description
4	80	23	BAR CODE SCANNER FAILURE Bar code scanner has failed. Reinitialize element status.
4	81	See Table 25	PICKER HARDWARE FAILURE Picker hardware failure. Call Technical Support.
5	81	C0	TRANSPORT FULL The picker contains a cartridge. Issue a command to retrieve the cartridge from the picker and place it in either a bin or a tape drive.
5	81	E0	PICKER INVALID START CONDITION Picker hardware condition is unknown. Issue a Rezero Unit command.
5	81	F0	PICKER INVALID COMMAND Picker hardware commanded to position out of system mechanical limits. Issue a Rezero Unit command.
4	82	See Table 25	ROTARY HARDWARE FAILURE Rotary hardware failure. Call Technical Support.
5	82	E0	ROTARY INVALID START CONDITION Rotary hardware condition is unknown. Issue a Rezero Unit command.
5	82	F0	ROTARY INVALID COMMAND Rotary axis was commanded to a position out of its legal range. This is an internal code failure.
4	83	See Table 25	EXTENSION HARDWARE FAILURE Extension hardware failure. Call Technical Support.
5	83	E0	EXTENSION INVALID START CONDITION Extension hardware condition is unknown. Issue a Rezero Unit command.

Table 24: Sense data values (Hexadecimal) (Continued)

Sense Key	ASC	ASCQ	Message Name/Description
5	83	F0	EXTENSION INVALID COMMAND Extension hardware was commanded to a position out of the systems mechanical limits.
4	84	See Table 25	VERTICAL HARDWARE FAILURE Vertical hardware internal failure. Call Technical Support.
5	84	E0	VERTICAL INVALID START CONDITION Vertical hardware condition is unknown. Issue a Rezero Unit command.
5	84	F0	VERTICAL INVALID COMMAND Vertical hardware commanded to position out of system mechanical limits. Issue a Rezero Unit command. If the problem persists, calibrate the library.
4	85	See Table 25	HORIZONTAL HARDWARE FAILURE Horizontal hardware failure. Call Technical Support.
5	85	E0	HORIZONTAL INVALID START CONDITION Horizontal hardware condition is unknown. Issue a Rezero Unit command.
5	85	F0	HORIZONTAL INVALID COMMAND Horizontal hardware commanded to position out of system mechanical limits. Issue a Rezero Unit command. If the problem persists, calibrate the library.
4	87	See Table 25	DEPTH HARDWARE FAILURE Depth hardware failure. Call Technical Support
5	87	E0	DEPTH INVALID START CONDITION Depth hardware condition is unknown. Issue a Rezero Unit command.

Table 24: Sense data values (Hexadecimal) (Continued)

Sense Key	ASC	ASCQ	Message Name/Description
5	87	F0	DEPTH INVALID COMMAND Depth hardware commanded to position out of system mechanical limits. Issue a Rezero Unit command. If the problem persists, calibrate the library.
4	88	00	WARNING SAFE TEMPERATURE EXCEEDED This is only a warning that the temperature in the library exceeds the normal operational temperature (96.8°F).
4	88	01	MAXIMUM TEMPERATURE EXCEEDED The robot in the cabinet that has overheated turns off and remains off until the temperature returns to an acceptable level (59-90°F).
4	89	00-FF	VISION HARDWARE FAILURE Vision internal failure. Call Technical Support.
5	8A	02	UNCALIBRATED POSITION System requires calibration.
6	8A	02	CALIBRATION FAILURE Check slots, cartridges, all internal elements
4	8B	See Table 25	CLM HARDWARE FAILURE CLM failure. Call Technical Support.
5	8B	E0	CLM INVALID START CONDITION CLM hardware condition is unknown. Issue a Rezero Unit command.
5	8B	F0	CLM INVALID COMMAND CLM hardware commanded to position out of system mechanical limits. Issue a Rezero Unit command. If the problem persists, calibrate the library.
B	8B	C0	TRANSPORT FULL The CLM contains a cartridge. Issue a command to retrieve the cartridge from the CLM and place it in either a bin or a tape drive.

Table 24: Sense data values (Hexadecimal) (Continued)

Sense Key	ASC	ASCQ	Message Name/Description
B	8C	01	LOAD PORT LATCH FAILURE The load port door was unlocked, but did not leave its current position before time-out (30 seconds). This may be due to the door being stuck, or in the case of a close operation, the operator not moving the door.
4	8C	06	LOAD PORT DOOR OPEN Load port door unlocked but failed to open.
4	8E	03	CABINET CONTROLLER UNABLE TO UPLOAD Unable to upload firmware to the cabinet controller.
4	8E	04	ROBOTICS CONTROLLER UNABLE TO UPLOAD Unable to upload firmware to the robotic controller.
B	8F	00	LIBRARY UNIT COMMAND TIMED OUT Verify that communications to library still exists by issuing another command
4	F3	02	DRIVE COMMUNICATION TIMEOUT The library is unable to communicate with a drive.
4	F3	20	DRIVE UNLOAD FAILED OR TIMED OUT The command to the drive to unload the tape failed to complete or timed out.
4	F3	21	DRIVE EJECT FAILED OR TIMED OUT The command to the drive to eject a tape failed to complete or time out.
4	F3	22	DRIVE LOAD FAILED OR TIMED OUT The command to the drive to load a tape failed to complete or timed out.
4	F3	23	DRIVE THREAD FAILED OR TIMED OUT The command to the drive to thread a tape failed or timed out.

Table 25: Hardware Failure ASCQ Values

ASCQ	Description
00-0F	OTHER Hardware internal failure. Call Technical Support.
10-1F	ENCODER/MOTOR Check the motor/encoder connector.
20-2F	HOME SENSOR/FLAG Home sensor/flag failure. Check home sensor connector and flag.
30-3F	MECHANICAL POSITION ERROR Hardware did not reach desired position. The axis path could be obstructed. Determine the cause of the obstruction. Retry command. If the failure recurs, run self-test.
40-4F	TIMEOUT Hardware did not reach desired position. The axis rail lubrication may be insufficient. The axis belt may be too tight. The motor pulley may be loose. Retry the command. If the failure reoccurs, then run selftest.
50-5F	OVER CONTROL The hardware is obstructed. Determine the cause of the obstruction. Retry the command. If the failure reoccurs, then run selftest.
60-6F	FPGA FAILURE Robotics FPGA has failed. Call Technical Support.
70-7F	POSITIONAL DRIFT The hardware home position is drifting. Call Technical Support.
80-8F	MAPPING FAILURE Scanner was unable to detect optical target during calibration.

Table 25: Hardware Failure ASCQ Values (Continued)

ASCQ	Description
90-9F	FORCE ERROR While pushing a cartridge into a bin or drive, the extension axis never made contact with any object.
A0-AF	SENSOR FAILURE A sensor transition did not occur as expected or an extra transition occurred during calibration, inventory or pick/place. Retry the command. If the failure recurs, contact Technical Support.
B0-BF	ELECTRONICS NOT PRESENT Electronics necessary for hardware to function is not present. Install necessary hardware.

Event Reporting



The library is capable of reporting a variety of events that occur within the cabinet. An event is defined as any occurrence that requires user attention and possible intervention. These events are either report through the OCP or through E-mail alerts.

Library events are broken up into the following sections:

- [Information events](#), page 150
- [Warning events](#), page 152
- [Critical events](#), page 154

Information events

Informational events are for user information only and do not require any intervention on the cabinet such as replacing components or updating software.

[Table 26](#) lists the information events provided by the library.

Table 26: Information events

Information Events
Cabinet *cabinet number door state changed
Load Port opened
Load Port closed
Mode parameters for cabinet changed
Mode parameters for partition changed
Cabinet has been stopped
Cabinet has been started
Cabinet is now offline
Cabinet state change to online
Partition state change to online
Cabinet state change to going online
Drive *drive added
Drive *drive removed
Drive *drive power on
Drive *drive power off
Partition prevent / allow changed
Load port *loadport
Panel opened
Panel closed
User *user logged in
User *user logged out
Added new user
Updated user
Removed user

Table 26: Information events (Continued)

Information Events
Added new SNMP community
Updated SNMP community
Removed SNMP community
Added new trap destination
Updated trap destination
Removed trap destination
Updated date and time
Updated IP address
Updated subnet mask
Updated hostname
Updated domain
Updated default gateway
Updated email server
Updated DNS address
Library Name changed
Library shutdown requested from remote GUI
Library reboot requested from remote GUI
Contract number updated
Upload file complete
Upgrade firmware complete
Updated OCP Password
Updated Subnet Mask
Updated Default Gateway
Updated IP address
<i>* indicates a variable character. This will change depending on the specific item within the cabinet.</i>

Warning events

Warning events indicate that a possible error condition exists within the cabinet. These events give the user a chance to check the cabinet before a failure occurs.

[Table 27](#) lists the warning events provided by the library.

Table 27: Warning events

Warning Events
Tape move failed
Tape inventory failed
Sensor *name may need attention
Sensor *name may need attention
Tape Alert Flag 1 - Read Warning
Tape Alert Flag 2 - Write Warning
Tape Alert Flag 3 - Hard Error
Tape Alert Flag 7 - Media Life
Tape Alert Flag 8 - Not Data Grade
Tape Alert Flag 15 - Memory in Cartridge Failure
Tape Alert Flag 17 - Read Only Format
Tape Alert Flag 18 - Tape Directory Corrupted
Tape Alert Flag 21 - Clean Periodic
Tape Alert Flag 29 - Drive Maintenance
Tape Alert Flag 32 - Interface
Tape Alert Flag 34 - Download Fault
Tape Alert Flag 35 - Drive Humidity
Tape Alert Flag 36 - Drive Temperature
Tape Alert Flag 37 - Drive Voltage
Tape Alert Flag 39 - Diagnostics Required
Error setting SCSI ID
Cabinet *cabinet number door open
Diagnostic command *cmd command failed
Fibre drive configuration failed

Table 27: Warning events (Continued)

Warning Events
Unable to get medium changer statistics
NVRAM corrupted
Drive update
Logical unit init required
Logical unit is not ready
Operator medium removal request
Door is opened
Transfer full - command can not be executed
System is stopped
Logical unit is turned off-line
*panelname, sensor *name may need attention
Drive *drive number, sensor *name may need attention
Logical unit is not ready
Load Port unload error
Software Socket Failure
Software Socket Failure
No Matching Frame Name Found
Software Communication Failure
No data read for event
System Test Error
<i>* indicates a variable character. This will change depending on the specific item within the cabinet.</i>

Critical events

Critical events indicate that a failure has occurred in the cabinet. The user must intervene to return the cabinet to operation.

[Table 28](#) lists the critical events provided by the library.

Table 28: Critical events

Critical Events
Sensor *name needs attention
Sensor *name needs attention
Tape move failed
Tape inventory failed
Tape Alert Flag 4 - Media
Tape Alert Flag 5 - Read Failure
Tape Alert Flag 6 - Write Failure
Tape Alert Flag 9 - Write Protect
Tape Alert Flag 13 - Recoverable Snapped Tape
Tape Alert Flag 14 - Unrecoverable Snapped Tape
Tape Alert Flag 16 - Forced Eject
Tape Alert Flag 20 - Clean Now
Tape Alert Flag 22 - Expired Cleaning Media
Tape Alert Flag 23 - Invalid Cleaning Cartridge
Tape Alert Flag 30 - Hardware A (Reset Needed)
Tape Alert Flag 31 - Hardware B (Power Cycle Needed)
Tape Alert Flag 33 - Eject Media
Tape Alert Flag 38 - Predictive Failure
Diagnostic command *cmd command failed
Unable to get medium changer statistics
Maximum temperature exceeded
Drive update
Library communication time-out
Incompatible media

Table 28: Critical events (Continued)

Critical Events
Transfer full - at end of place
Transfer empty - command aborted
Load retry failed
Cartridge partially gripped
Low power error
Motor power failure
Bar code decoder communication failure
Gripper timeout
Gripper open failure
Gripper close failure
Unable to pick cartridge
Rotary timeout
Rotary front failed
Rotary back failure
Rotary home not found
Rotary axis internal failure
Rotary invalid command
Extension timeout
Extension current feedback failure
Extension mechanical position error
Vertical home not found
Vertical test failure
Vertical encoder failure
Vertical mapping failure
Horizontal timeout
Horizontal mechanical position error
Horizontal home not found
Horizontal test failure
Horizontal encoder failure

Table 28: Critical events (Continued)

Critical Events
Horizontal mapping failure
Warning safe temperature exceeded
Load port timeout
*panel name, sensor *name needs attention
Drive *drive number, sensor *name needs attention
Gripper hardware failure
Extension internal failure
Vertical internal failure
Horizontal internal failure
Logical unit communication failure
Rotary invalid start condition
Extension invalid start condition
Depth hardware failure
Vision hardware failure
CLM hardware failure
CLM invalid start condition
CLM invalid command
Transport full
Load port door open
Cabinet controller unable to upload
Robotic controller unable to upload
Library unit timed out
Drive communication timeout
Drive unload failed or timed out
Drive eject failed or timed out
Drive thread failed or timed out
SCSI event
Abort command
Invalid CDB received

Table 28: Critical events (Continued)

Critical Events
No Mond connection
No HBAs found
Fork new ted failed
Initialization failed
Parse error
Software Socket Failure
Software Socket Died
Software Socket Failure
Software Socket Died
Cabd unable to start new thread
Cabinet Not Found
Software Pipe Failure
Software Communication Error
Software Socket Failure
Software Socket Failure
<i>* indicates a variable character. This will change depending on the specific item within the cabinet.</i>

Glossary

This glossary defines terms used in this guide or related to this product and is not a comprehensive glossary of computer terms.

Antistatic mat

A mat made of antistatic material which includes a cabled connection to ground at a wall receptacle.

ASC

The Additional Sense Code is part of the SCSI-2 specification. The additional sense code (ASC) field indicates further information related to the error or exception condition reported in the sense key field.

ASCQ

Additional Sense Code Qualifier is part of the SCSI-2 specification. The additional sense code qualifier (ASCQ) indicates detailed information related to the additional sense code.

AutoClean

A user-defined mode made on the touch screen GUI by which the library automatically performs drive cleaning tasks.

Bit

The basic unit of data in a binary numbering system (*binary digit*), represented by a 0 or a 1. Eight bits equals one byte.

Byte

The basic unit of computer memory which is large enough to hold one character.

Calibrate

A process used by the library robotics to determine the exact position of storage, data transfer, and import/export elements.

Check Condition status

Blocks of data are stored on the tape medium along with additional information that the library controller uses to manage storage and retrieval. The format of the additional information is unique and is hidden from the initiator during normal read or write operations. This additional information is often used to identify the physical location of the blocks of data and the address of the logical block, and to provide protection against the loss of the user data.

The address of the first logical block is zero. The address of the last logical block is $[n-1]$, where $[n]$ is the number of logical blocks available on the medium. A Read Capacity command may be issued to determine the value of $[n-1]$. If a command is issued that requests access to a logical block not within the capacity of the medium, the command is terminated with CHECK CONDITION.

CISPR 22

This standard describes the emissions testing methods and test limits for information technology equipment, such as computers, office machines, or telecommunications equipment connected to low - voltage power main networks ($<600V$). It does not apply to equipment whose primary function is radio transmission or reception as defined by the International Telecommunications Union (ITU) Radio Regulations.

The object of the standard is to establish uniform requirements for the conducted and radiated disturbance levels of the equipment covered by the standard. Disturbance limits are established for Class A and Class B equipment, and measurement methods, operating conditions, and interpretation of results are addressed.

Class A digital device

Class A equipment is intended for Commercial installation.

Class I laser product

Class 1 lasers are products where the power of the laser beam produced (the accessible emission) is always below the Maximum Permissible Exposure value. Therefore, for Class 1 lasers the output power is below the level at which it is believed eye damage will occur. Exposure to the beam of a Class 1 laser will not result in eye injury. Class 1 lasers may therefore be considered eye safe.

Class II laser product

Class 2 lasers are limited to a maximum output power of 1 mW. A person receiving an eye exposure from a Class 2 laser, either accidentally or as a result of someone else's deliberate action (misuse) will be protected from injury by their natural blink reflex. This is a natural involuntary response which causes the individual to blink and avert their head thereby terminating the eye exposure.

Elements

SCSI designation for any device or bin in the library that can hold a cartridge. SCSI elements include storage bins, tape drives, load port bins, and the picker.

EMI

Electro-Magnetic Interference refers to unwanted electrical noise present on a power line. This noise may leak from the power lines and affect equipment that isn't even connected to the power line. Such leakage is called a magnetic field. Magnetic fields are formed when unwanted noise voltages give rise to noise currents. Such noise signals may adversely affect electronic equipment and cause intermittent data problems.

ESD

Electrostatic Discharge

Host

The device or devices to which the library is connected.

IEC

The International Electrotechnical Commission is based in Geneva, Switzerland.

Load port

The revolving assembly on a front door of enterprise libraries that incorporates a revolving drum and tape cartridge bins for loading and unloading tape cartridges.

LTO-2

Linear Tape-Open is a tape drive specification backed by HP, IBM and Seagate. Ultrium 460 tape drives (LTO-2) are HP's second generation of LTO tape drives.

LVD

Low Voltage Differential or LVD is a type of electrical signaling for parallel SCSI and can reach distances up to 12 meters. All HP Ultrium 460 tape drives are LVD devices. SDLT tape drives can be LVD or HVD devices.

MSBF

Mean Swaps Before Failure

MTBF

Mean Time Between Failures

MTTR

Mean Time To Repair

NEMA

National Electrical Manufacturers Association

Network interface Card (NIC)

A NIC is a device that handles communication between a device and other devices on a network.

NVRAM

Non-Volatile Random Access Memory is a type of memory that retains its contents when power is turned off. One type of NVRAM is SRAM that is made non-volatile by connecting it to a constant power source such as a battery. Another type of NVRAM uses EEPROM chips to save its contents when power is turned off. In this case, NVRAM is composed of a combination of SRAM and EEPROM chips.

PCI

The PCI bus typically runs at speeds of 33 MHz or 66 MHz and is usually 32 bits wide. This means that it passes 32 bits of data simultaneously as if down 32 separate wires. Some of the most recent computers include wider 64-bit PCI buses, and already certain very high-end video capture cards offer improved performance if connected to a 64-bit PCI bus.

Picker

A mechanical component of the extension axis assembly (robotics) which grips and holds a tape cartridge in transit

Reports

Refers to the report options on the touch screen GUI's Service screen.

Robotics

As used in the context of automated tape libraries; the X-axis, Y-axis, and Z-axis mechanical assemblies inside the library used to move tape cartridges.

RS-232C

Short for Recommended Standard-232C, a standard interface approved by the Electronic Industries Association (EIA) for connecting serial devices. This standard is for asynchronous transfer between computer equipment and accessories. Data is transmitted bit by bit in a serial fashion. The RS-232 standard defines the function and use of all 25 pins of a DB-25 type connector.

SCSI

Small Computer System Interface. An American National Standards Institute (ANSI) communications standard for attaching peripheral equipment to computers.

SCSI ID

A unique address (0 to 15) assigned to each device on a SCSI bus.

SCSI-2

A second generation SCSI interface which includes command sets for magnetic and optical disks, tapes, printers, processors, CD-ROMs, scanners, medium changers, and communication devices.

SDLT

Super Digital Linear Tape is a Quantum tape drive and tape cartridge specification offered in three ranges of capacity and transfer rates for workgroup, mid-range, and enterprise needs.

SNMP

Short for *Simple Network Management Protocol*, a set of protocols for managing complex networks.

Take-up leader

The ring at the beginning of a tape in a cartridge.

Tape drive controllers

A device that controls the transfer of data from a host to a tape drive and vice versa.

Terabyte

A unit of measure for digital data equal to approximately 1,000 gigabytes, or 1,099,511,627,776 bytes!

Terminator

Special electrical resistors (terminators) are installed in the SCSI devices at each end of the SCSI bus and are **not** installed in other devices on the bus. The SCSI bus must be properly terminated at both ends so that commands and data can be transmitted to and from all devices on the bus.

